Australian National University

Primary health care service delivery by international actors in humanitarian emergencies

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A thesis submitted for the degree of
Doctor of Philosophy
of The Australian National University

September 2019

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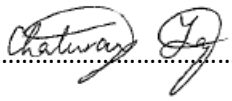
Declaration and statements of contribution

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at ANU or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at Médecins sans Frontières or elsewhere, is explicitly acknowledged in the thesis. I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation or linguistic expression is acknowledged.

This thesis is approximately 56,000 words in length, excluding the abstract, tables, figures, references and appendices.

Signed: 

Date: 13 September 2019

Acknowledgements

When I was first presented the opportunity to undertake a PhD on a topic of my choosing in the humanitarian health field, I thought I had struck gold. Little did I know what I was in store for over the next three and half years! This PhD has been one of the toughest endeavours I have undertaken, and it would not have been possible without the support, guidance and kindness given by many along the way.

Firstly, thanks go to my supervisory panel – Dr Kamalini Lokuge, Associate Professor Kathryn Glass, Dr Tambri Housen and Professor Cathy Banwell who have provided valuable professional and personal support over the duration of this PhD. Each of you have contributed in different ways to the development of my thinking and I have appreciated the diversity of perspectives. I am indebted to Professor Maree Hackett for her support and mentorship when I have most needed it. Thank you for making me see the bigger picture and for making this project seem achievable.

Thanks are also due to other colleagues at the Research School of Population Health (RSPH) - Dr Nasser Bagheri and Dr Kinley Wangdi who helped in conducting the geospatial analytical component of Chapter 6. A huge thank-you to Akash Patel and Sam Gerami for helping me with the grey literature search of my literature review. Thanks also goes to colleagues at MSF – Hammoud Shell, Myrto Schaefer, Laura Latina, Philippa Boulle and Iza Ciglenecki for providing me access to MSF projects, data and general advice. Thank you to Louise (Loulou) Johnston who is a constant source of inspiration and a true humanitarian. I have enjoyed our many lengthy discussions and debates on how we can do better in humanitarian health action.

A very special thank you goes to Associate Professor Barry Newell and Dr Katrina Proust. You agreed to meet and coach a perfect stranger to share your valuable knowledge and time, on the off-chance that she might learn something about systems thinking. Your generous gesture changed the course of my PhD, and the way I see the world. Thank you for blowing my mind.

I have been blessed to have been part of a group of PhD students at RSPH who have been constantly supportive, encouraging and most of all, wonderful friends. To Jenny Welsh – thank you for sharing the glorious times and the woeful times of the PhD journey. Your counsel, words of wisdom and above all your enthusiasm and joy for the process has been priceless. Thank you to Naomi Clarke for always being there to help and your amazing formatting skills. To my other dear friends at RSPH – Polly Wallace, Sally Carter, Tehzeeb Zulfiqar, Bobby Maher and others, thank you for being a constant source of encouragement and support. I hope to continue the wonderful friendships that we have made.

I would like to acknowledge the following funding bodies for financial assistance towards the conduct of this thesis, or for financial assistance towards travel to present the findings from this thesis: the Australian Government's Research Training Program, MSF Australia's top-up scholarship in 2017, MSF Australia's field worker grant, the Australian National University Vice Chancellor's travel award and Professor Robyn Lucas.

I would like to thank the wonderful MSF teams that I worked with in Lebanon and Nigeria. It is always such a joy to work with such dedicated and hard-working people. I would also like to acknowledge all the women, men and children I met in Lebanon and Nigeria, and all those who continue to be affected by humanitarian emergencies today. We cannot know what it must be like to be in your shoes, but we can and do stand with you in solidarity and humanity.

Finally, thank you to my parents and my family. Coming back home to write-up the thesis was the best decision I could have made. Your incessant love, belief and unwavering faith in me helped me get to the end. Thank you for exemplifying the values of kindness, compassion and humanity. Thank you for being a constant source of inspiration and for instilling in me that we are here to serve.

Abstract

Primary health care (PHC) is usually the first point of contact people have with a country's health system. The aim of PHC is to provide comprehensive, accessible, community-based care that meets the health needs of individuals throughout their lifetime. It is acknowledged from high-income countries that a health system with strong PHC as its core delivers better health outcomes, is more efficient and is associated with improved quality of care compared to other models.

Humanitarian emergencies are characterised by the inability of an affected population to cope with an event using their own resources. In such circumstances, international actors often provide humanitarian assistance to affected populations. These populations predominantly access health services at the PHC level. In fact, the largest medical humanitarian non-government organisation, Médecins sans Frontières (MSF) conducts between eight and 11 million outpatient consultations at the PHC level annually compared to only between 250,000 and 400,000 consultations at the secondary care level. Despite the significance of PHC service delivery in humanitarian emergencies, there are currently no established guidelines for the implementation of PHC services by MSF, or the humanitarian community at large. The most commonly referred standards for humanitarian action, the Sphere guidelines, provide a basic overview of the health infrastructure required, however there are no further specifications related to the context, the existing national health infrastructure, or patient needs and/or expectations within the PHC system of a country affected by a humanitarian emergency.

The overarching aim of this thesis is to provide empirical evidence to describe the primary health care system which exists in a humanitarian emergency from the perspective of international actors. To achieve this aim, I addressed three key research questions: firstly, what is currently known about how PHC services are delivered in humanitarian emergencies by international actors? secondly, how do key concepts of PHC apply in a humanitarian emergency? and finally, what does a health systems approach look like with respect to PHC delivery in a humanitarian emergency?

To answer the first question, I undertook a scoping narrative literature review of peer-reviewed literature between 1978 and 2016 and grey literature between 2013 and 2018. I looked at primary reports of PHC interventions delivered during the acute phase of a humanitarian emergency by international actors, and analysed these interventions against an existing PHC framework. From this, I found that the PHC system collapses during a humanitarian emergency, particularly around 'System' and 'Input' level factors, that international actors delivered PHC services according to their own capacity, setting their own aims and objectives, and that little consideration was given to community empowerment in service delivery.

I used field visits to MSF projects in northern Nigeria and Lebanon as case studies to answer the second research question. In northern Nigeria, a visit to a MSF maternal health care project inspired a realist analysis into the wider contextual factors underlying this project. This analysis highlighted the importance of understanding the 'context' of an intervention, including the role of PHC in developing a comprehensive approach to address maternal and neonatal mortality and morbidity. In the Bekaa valley region of Lebanon, I used routinely collected patient data on non-communicable diseases (NCDs) from four MSF PHC clinics to investigate the concepts of geographic accessibility and availability of facilities for Syrian refugees accessing care for NCDs. I also considered the concepts of adjustment to population health needs and continuity of care as it applied to this same population group. I found that access to care was dependent on context, that there was a relationship between continuity of care and access to a clinic, and that humanitarian access needs to be factored into PHC access in humanitarian settings.

The final research question was answered by applying the principles of complex adaptive systems theory, the findings from the case studies and my own experiences as a humanitarian practitioner. I developed a conceptual framework to explain the dynamic relationship between the national health system of a country, the system created by international actors and that of individuals and communities involved in health service delivery during a humanitarian emergency.

The findings presented in this thesis have important implications for practice and further research. International health service providers working in humanitarian emergencies need to better understand the context within which PHC services are delivered to provide effective and relevant health care. The principles of PHC are relevant in humanitarian emergencies, however they need to be adapted. If we are to achieve the goals of the Declaration of Astana to 'leave no one behind', we must place greater emphasis on understanding the inter-dependent relationships between the national health system, international actors and communities themselves.

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List of Abbreviations

ANC	Antenatal care
BEmONC	Basic emergency obstetric and neonatal care
CAS	Complex adaptive systems
CEmONC	Comprehensive emergency obstetric and neonatal care
CHW	Community health worker
CoPs	Communities of Practice
CBPR	Community based participatory research
CMO	Context-mechanism-outcome
CMOC	Context-mechanism-outcome configuration
CMR	Crude mortality rate
COPD	Chronic obstructive pulmonary disease
CVD	Cardiovascular disease
DM	Diabetes mellitus
EmOC	Emergency obstetric care
FHC	Fixed health centre
GP	General practitioner
HIV	Human Immunodeficiency Virus
HTN	Hypertension
iNGOs	International non-government organisations
IASC	Inter-Agency Standing Committee
ICRC	International Committee of the Red Cross
IDP	Internally displaced persons
IFRC	International Federation of Red Cross and Red Crescent Societies
IRC	International Rescue Committee
JGH	Jahun General Hospital
LBP	Lebanese pounds
LGA	Local government area
LMIC	Low- and middle-income countries
MC	Mobile clinics
MDOC	Major direct obstetric complication
MMR	Maternal mortality ratio
MoH	Ministry of Health
MoPH	Ministry of Public Health
MoSA	Ministry of Social Affairs
MSF	Médecins sans Frontières
NCD	Non-communicable disease
NGO	Non-governmental organisation
NICE	National Institute for Health and Care Excellence
OPD	Outpatient department
ODIHPN	Overseas Development Institute Humanitarian Practice Network
PHC	Primary Health Care
PHCC	Primary health care clinics
PHCPI	Primary Health Care Performance Initiative
PRISMA-ScR	PRISMA extension for scoping reviews

PSEC	Patient support and education counselling
RMNCH	Reproductive, maternal, neonatal and child health
ToC	Theory of change
UN	United Nations
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
UNRWA	United Nations Relief and Works Agency for Palestine Refugees
US	United States
USD	United States dollars
VVF	Vesicovaginal fistula
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WHO-LIS	World Health Organization's library database

Chapter 1 Introduction

1.1 Preamble

The number of people affected by humanitarian emergencies, such as conflicts and natural disasters, is at its highest point in human history (1). The 2018 Global Humanitarian Overview reports that in 2018, more than 135 million people were in need of humanitarian assistance and protection, a 22% increase from 2017 (1). The number of refugees, internally displaced and other forcibly displaced persons has increased steadily over the last decade to 68.5 million people (2). Natural disasters related to climate and weather (such as floods and storms) are becoming increasingly frequent (3), as are the overall number of global armed conflicts, particularly related to internal conflict (4). Moreover, the nature of conflicts is changing such that protracted crises are the 'new normal' (1). In 2018, 19 of the 21 global humanitarian response plans were for humanitarian crises that have been ongoing for five years or longer (1). Thirteen of these 21 (62%) humanitarian response plans were for countries located in Africa, five in the Middle-East region, one in Central America, one in Asia and one in Eastern Europe (1).

The health system of a country, particularly in low and middle-income countries, is often severely affected by humanitarian emergencies. These health systems are often ill-equipped and poorly-prepared to cope with the increased and varied health care needs that arise from humanitarian emergencies. This results in humanitarian interventions and delivery of health care services by numerous international actors, including multilateral organisations and international non-government organisations (iNGOs) (5). During the acute phase of a humanitarian emergency, the goal of these international health actors is to prevent and reduce excess mortality and morbidity in the affected population (6). While the patterns of morbidity and mortality will be affected by the type and extent of the disaster (7), a significant component of the health response in any emergency will occur at the primary health care (PHC) level.

One of the largest iNGOs providing health services in humanitarian emergencies is Médecins sans Frontières (MSF). In 2018, MSF provided medical and humanitarian assistance in 446 field projects across 74 countries, more than half (56%) of which were located in Africa (8). A quarter of the projects were in settings of armed conflict, just over a quarter (26%) in settings of internal instability and close to half (45%) in stable settings (8). Between 2013 and 2018, MSF conducted between eight and 11 million consultations at the primary health care level, representing approximately 90% of its total activity each year (9-13).

Primary health care is rooted in the provision of essential health care, the implementation of public health activities, inter-sectoral collaboration and community participation (14). Conceptualised in

this way, PHC can play a crucial role in providing essential health services during a humanitarian emergency, perform a key role in disease surveillance and outbreak detection, among other public health functions, and engage and connect with crisis-affected communities. The global community at the 2018 Global Conference on Primary Health Care in Astana, Kazakhstan reaffirmed its commitment to PHC as the means to achieving universal health coverage, including in emergencies in fragile and conflict-affected states (15).

It is against this backdrop that this PhD research has been conducted. This introductory chapter outlines some key concepts and definitions used in my PhD research, provides a brief overview of the role of primary health care in humanitarian emergencies, discusses the key evidence gaps in this area and outlines the corresponding research aims of my thesis. It also describes my role as a researcher and humanitarian practitioner in the context of this PhD.

1.2 Key definitions and concepts

There are numerous terms used in humanitarian action that are interpreted differently by different individuals, organisations and actors. For clarity, the key terms and concepts used throughout this thesis are defined below.

1.2.1 Humanitarian emergencies and disasters

The Inter-Agency Standing Committee (IASC) is the primary governing body responsible for coordinating humanitarian assistance between agencies. In this thesis, I used the IASC definition of a humanitarian emergency, which is:

> *"A singular event or a series of events in a country or region that cause serious disruption to the functioning of a society, resulting in human, material, or environmental losses which exceeds the ability of affected people to cope using their own resources. A crisis may be further classified according to its speed of onset (sudden or slow), its length (protracted) or cause (natural or man-made hazard or armed conflict)"* (16).

This definition therefore includes both sudden-onset natural disasters and protracted crises such as civil and inter-state armed conflicts (man-made disasters), which result in the intervention of international humanitarian actors. A humanitarian emergency becomes a complex emergency when it is associated with political instability and armed conflict (17).

Disasters are further defined as: "events that occur when significant numbers of people are exposed to hazards to which they are vulnerable, with resulting injury and loss of life, often combined with

damage to property and livelihoods" (18). Emergencies are situations that arise out of disasters, where the affected community's ability to cope has been overwhelmed, and where rapid and effective action is required to prevent further loss of life and livelihood (18).

1.2.2 Phases of a humanitarian emergency

The phases of a humanitarian emergency can be classified in numerous ways (19-22). For this thesis, I have chosen to use the four phases describes by Townes (20). These are the pre-emergency, acute emergency, post emergency and recovery phases.

The pre-emergency phase describes the baseline level of functioning of a country. Low- and middle-income countries (LMICs) are disproportionately affected by humanitarian emergencies, often secondary to armed conflict (23, 24). The pre-existing health system of these conflict-affected states are among the weakest globally, often accompanied by the worst global health indicators (24, 25). Subsequently, during a humanitarian emergency, these already fragile health systems with limited resources are unable to cope with the sudden increase in health needs in an efficient or effective manner (24). In this pre-emergency phase, governments may have emergency prevention and preparedness plans in place in the event of a disaster (20).

The acute emergency phase begins immediately after disaster strikes. In the absence of a known baseline, the threshold for defining the acute emergency phase of a disaster is a crude mortality rate (CMR) greater than 1/10,000/day or under-five CMR greater than 2/10,000/day (20). A doubling or more of the CMR from its baseline rate in the affected population is considered to indicate a significant public health emergency, requiring an immediate response (6, 20). This phase is often distinguished by mass population movements, widespread damage to economies and societies, an overwhelmed or inadequate response from local authorities and a breakdown of normal coordination mechanisms (7, 20, 26). During this phase, humanitarian organisations begin to respond, focusing on providing critical services such as food, water, sanitation, health care and shelter (6). The priority during this phase is to prevent and reduce excess mortality and morbidity. This period begins soon after needs are identified, and does not have a set date or time period; it can last from days to months to years (19). It includes protracted crises, which have been defined as "those environments in which a significant proportion of the population is acutely vulnerable to death, disease and disruption of livelihoods over a prolonged period of time" (27). There is evidence to suggest that the level of services provided by international actors during this acute phase can often be higher than was previously available to the population pre-emergency (28-30).

The post-emergency and recovery phases are characterised by a reduction in crude mortality rates back to baseline and slowing down of population movements (19, 20). Aid organisations focus on

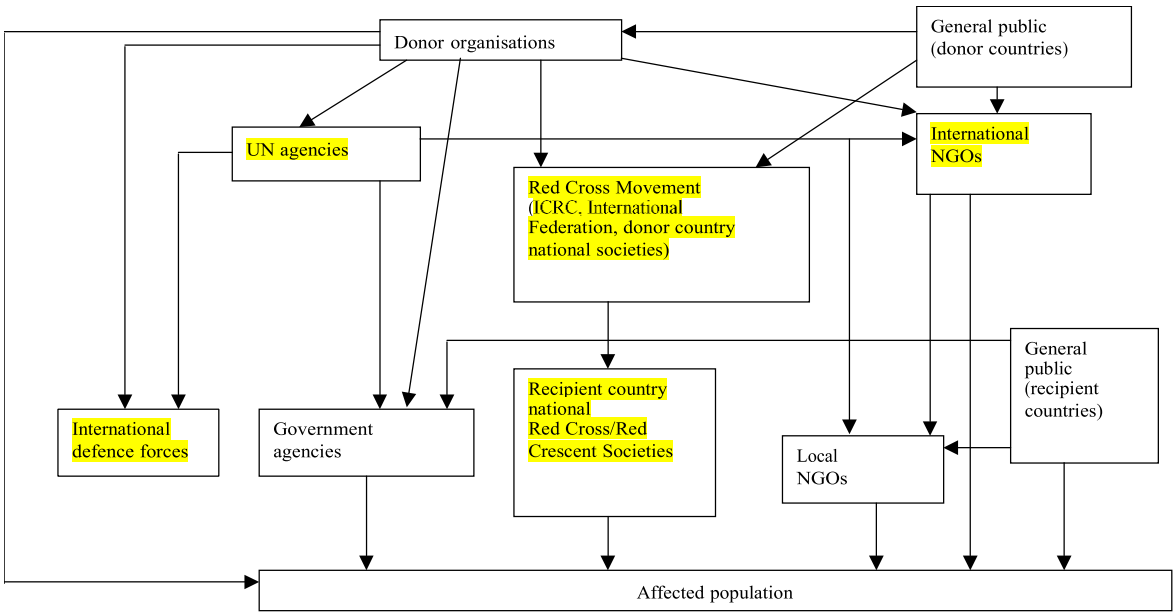
providing more routine services and development organisations start to take the place of international relief organisations with increased responsibility handed over to national authorities (19, 20, 31).

It must be recognised that in reality, there are no clear-cut lines between the phases of a given emergency. Moreover, characteristics of phases may be different in different emergencies (19, 20). This thesis focuses on the acute emergency phase of a humanitarian emergency, including in protracted crises, where services are predominantly delivered by international actors.

1.2.3 Humanitarian actors

This PhD looks at primary health care service provision by *international actors* in a humanitarian emergency. While I have not specifically examined the provision of health services by the national health system, I acknowledge that government agencies, where they exist, play a crucial role in service delivery during humanitarian emergencies. Service delivery by the national health system and other actors in the humanitarian response are discussed in further detail in Chapter 8. Figure 1.1 below shows the main actors typically involved in the international humanitarian system. They include government agencies, iNGOs, United Nations (UN) agencies and international defence forces as well as organisations within the Red Cross movement and foreign medical teams (not represented in Figure 1.1).

Figure 1.1: The international humanitarian relief system *



*The actors highlighted in yellow are those which are the focus of this PhD

Adapted from Macrae 2002, 'The new humanitarianisms: a review of trends in global humanitarian action', in ODI Humanitarian Policy Group

1.2.4 Primary health care versus primary care

The focus of this thesis is on primary health care, as opposed to primary care. The terms primary health care and primary care are sometimes used inter-changeably in the literature and amongst service providers. However, scholars note that there are key differences between these two terms. Primary care was first articulated by Barbara Starfield, an eminent scholar in this field, who defined it by these core features: first-contact accessibility, continuity of care across the life cycle, comprehensiveness of promotive, preventive, curative and palliative care service and coordination across service providers and levels of the health care system (32). Primary care is associated more with the long-term clinical care of individuals (33, 34).

Primary health care, on the other hand, encompasses a broader concept consistent with the core principles articulated in the 1978 Declaration of Alma Ata (33, 34). It describes a whole-of-society approach to health policy and service provision that includes both services delivered to individuals and includes wider public health and health system functions (34). Primary health care, as currently defined by the World Health Organization (WHO) involves three core components. These are primary care and essential public health functions as the core of integrated health services, multisectoral policy and action, and empowered people and communities (35).

While there may be differing views on terminology, there are common principles of primary care and primary health care. In a review of frequently used definitions for primary care and primary health care, Muldoon and colleagues found that the principles of first contact care, accessibility, comprehensiveness and coordination of care were common features of health service delivery in primary care and PHC (34).

1.3 Primary health care

1.3.1 A brief history: From the Declaration of Alma Ata, 1978 to the Declaration of Astana, 2018

Primary health care as a concept was first introduced to the global health community at the landmark joint WHO and United Nations International Children's Emergency Fund (UNICEF) global PHC conference in Alma Ata, Kazakhstan in 1978 (14). In its revolutionary vision, the Declaration of Alma Ata defined PHC as:

> *"Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost the community and country can afford to maintain at every stage of their development in the spirit of self-*

reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process" (14).

This definition was based on the principles of social equity, national coverage, self-reliance, inter-sectoral coordination and people's participation in the planning and implementation of health programs (14). It also acknowledged that PHC should be delivered comprehensively, addressing the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly (14). This concept of PHC was accepted by 134 member countries of the WHO in 1981 as the key to achieving 'Health for All' by the year 2000 (36).

While the concept of PHC in the Alma Ata Declaration was visionary, some argued that its goals were over-ambitious and its targets "beyond reproach" (37-39). In 1979, a year after the Alma Ata was signed, a landmark paper by Walsh and Warren outlined the concept of selective primary health care, as an interim strategy to achieving the goals of comprehensive PHC (38). Walsh and Warren's proposal was based on addressing priority medical conditions based on high prevalence, high morbidity or mortality and for which there were effective control strategies in place at the time (38). These priority medical conditions were determined to be diarrheal diseases, measles, malaria, whooping cough, schistosomiasis and neonatal tetanus (38). They suggested that the approach to achieve rapid gains for the most number of people was to design economically feasible and targeted health interventions (38). This selective approach to PHC came into full effect after UNICEF promoted four specific 'social and scientific advances' at the launch of its Children's Revolution in 1982-83 (40). These focus areas were growth monitoring, oral rehydration, breastfeeding and immunisation (40).

Although the approach of delivering vertical, disease-focused programs may be more pragmatic, it has been criticised by some for distorting the community-centred and holistic view of health described in the Alma Ata Declaration (41-43). However, regardless of the approach used by countries after 1978, there have been major health gains made over the last several decades. Malaria control programs have seen tremendous success over the past 15 years with the case incidence reduced by 41% and malaria mortality rates reduced by 62% between 2000 and 2015 (44). Substantial progress has also been made towards the goal of ending the Human Immunodeficiency Virus (HIV) epidemic, particularly in some of the worst-affected countries. For example, the HIV incidence in Zimbabwe has reduced from an estimated peak of 4 to 8% between 1988 and 1990 (45)

to an annual incidence of 2.8% in 2018 (46). The global under-five mortality rate has declined steadily since the 1980s, with accelerated reductions over the last two decades (47). Even in very-low income countries, an analysis of over 30 countries showed that reduction in under-five mortality is possible by provision of prioritised, highly effective services at high coverage (48). However, it was noted that further gains, especially for conditions dependent on curative case management or complex care (such as obstetric services or chronic disease care) depend on progression to comprehensive PHC (48).

While these gains have been commendable, in-depth analyses of these trends reveal that the burden of disease has been distributed unevenly between and within countries (47, 49), particularly those LMICs most affected by conflict and other disasters. Of the 5.4 million deaths that occurred in children under five in 2017, approximately half were in sub-Saharan Africa (47). In addition, under-five mortality rates among children in rural areas were 50% higher than children in urban areas (47). The WHO's 2017 global monitoring report on tracking universal health coverage indicates that the coverage of essential health services (including reproductive, maternal, newborn and child health, infectious diseases and non-communicable diseases) is lowest among low-incomes countries, some of which are affected by conflict (50). While malaria control efforts have benefited some countries, vulnerable groups with poor access to health services continue to be marginalised in others (51). The sub-Saharan Africa region shoulders the heaviest burden, with two countries—the Democratic Republic of Congo and Nigeria—accounting for more than 35 percent of global malaria deaths (51). These inequities in service provision and coverage are likely due to many factors, but highlight the increased fragmentation of service delivery, persistent weakness in the coordination of activities and resources, and weak health systems and supporting infrastructure.

The debate of the past three decades that focused on selective versus comprehensive PHC delivery, has now shifted towards combining the strengths of both approaches in health systems (52, 53). Debates of community versus facility-based health care are starting to shift towards building integrated health systems (52-55). Numerous seminal WHO reports written on PHC since the Declaration of Alma Ata have all called for the continued support of PHC as the means to achieving national coverage of health services in a way that is acceptable to the population receiving them (36, 56-58). In particular, the 2008 WHO report on the 30th anniversary of the Declaration of Alma Ata, titled "Primary health care: now more than ever", calls for the transformation and regulation of existing health systems, with the aim of providing universal access and social health protection (58). Importantly, it asks that people and not diseases are placed at the centre of health care (58). This appeal has been echoed in the more recent WHO framework on integrated people-centred health services, which also calls for the comprehensive needs of people and communities to be placed at

the centre of health systems, and for people to be empowered to play a more active role in their own health (59).

From Alma Ata to Astana, forty years after the first declaration on PHC was signed, the world returned to Kazakhstan to reaffirm its commitment to PHC. This time the theme was 'leaving no one behind' (15). Members participating in this global health conference acknowledged that PHC is a cornerstone for achieving universal health coverage and a key to achieving the health-related goals of the Sustainable Development Goals by 2030 (15). The theme of 'leaving no one behind' is particularly pertinent to health actors responding in humanitarian emergencies. The Declaration of Astana states that: "We will leave no one behind, including those in fragile situations and conflict-affected areas, by providing access to quality PHC services across the continuum of care" (15). The inclusion of fragile and conflict-affected areas in this Declaration appears to be an acknowledgement of the need to address PHC service delivery for the millions of people affected in these situations.

1.3.2 The role of primary health care in humanitarian emergencies

Humanitarian emergencies, particularly in the acute phase, are typically characterised by extensive loss of life, massive displacements of people and widespread damage to societies and economies, all of which necessitate large-scale and multi-faceted humanitarian assistance (7, 60). The breakdown in governance, health systems and infrastructure can last for years or decades, as with the current crises in South Sudan and Democratic Republic of Congo, leading to long-term deprivation of basic health services (1, 20). Access to health care is a critical determinant for survival during the acute phase of an emergency; the main goal at this stage being to prevent and reduce excess mortality and morbidity (61).

The health needs of a population in a humanitarian emergency are invariably affected by several factors, including the type and scale of the disaster (7). For example, immediately after an event such as an earthquake, the patterns of injury seen are consistent with physical trauma and orthopaedic injuries (62, 63). During conflicts, there may be periods of time when there is a requirement to provide health services for war-wounded and manage cases of major trauma and other physical injuries (64). These kinds of services are best provided at secondary health care facilities, and secondary health care plays a major role in reducing excess mortality and morbidity caused by a humanitarian emergency. However, a significantly greater proportion of populations affected by humanitarian emergencies are at risk of ill-health due to the direct and indirect consequences of the disaster (7, 26, 64). Large-scale population displacement and overcrowding, coupled with low vaccine coverage can expose populations to infectious diseases for which they had no prior immunity, or conversely, diseases such as malaria may be introduced into previously non-

endemic areas (7, 60). A lack of clean water and poor sanitation can lead to outbreaks of diarrheal disease and ongoing health issues, especially amongst children (64). Poor access to and availability of food can result in significant levels of malnutrition (20, 64). In addition to the morbidity specifically caused by the disaster, there are requirements for ongoing routine health care, particularly for pregnant women, children, the elderly and those with specific medical conditions during a humanitarian emergency (65).

While conflicts have historically involved countries at the lower end of economic development, many countries affected by conflict today are entering into their demographic and epidemiologic transition (66). While the traditional refugee camps of the 1970s and 1980s still exist, there is great variation in the settings in which humanitarian emergencies occur today (67). Contemporary contexts associated with forced migration and increasing trends in urban refugee settlement present different health care challenges to those encountered previously (2, 68). Health care needs in conflicts arising in settings with higher incomes and better baseline health reflect the health and demographic profile of the region. Patterns of illness seen in these crisis settings are often due to NCDs, such as diabetes, cardiovascular disease and cancer (67, 69). Health service providers in these circumstances therefore, need to address the health care needs of populations facing the double-burden of communicable and non-communicable diseases, as well as catering for an ageing population (66, 67).

During an emergency, basic services for the most prevalent health conditions are provided at the primary health care level by the numerous health actors involved. In fact, for MSF, the largest international medical humanitarian iNGO working in humanitarian emergencies, the majority of activity conducted each year is at the PHC level. MSF conducted between eight and 11 million consultations at the PHC level between 2013 and 2018, compared to between 250,000 and 400,000 secondary care consultations, highlighting the demand for services at this level of the health system (9-13).

Primary health care during an emergency has the ability to provide essential health services, identify manage and refer emergency cases and play a key role in providing essential public health functions such as outbreak detection, disease surveillance and health promotion (65). During an emergency, there is also the opportunity to engage effectively with affected communities at the PHC level, owing to the close links and networks established between communities and the existing PHC system. A PHC approach can also play an important role in emergency preparedness and community resilience by working with communities, across the continuum of the phases of the emergency (65).

For health service providers responding to and providing PHC services during an emergency, it is essential to work within the capacity of the national health system. The Sphere guidelines, which

provide a minimum set of standards for humanitarian response, state that the way health interventions are "planned, organised and delivered in response to a disaster can either enhance or undermine existing health systems and their future recovery and development" (61). These guidelines acknowledge that a health systems approach will progressively realise the right to health during the crisis and recovery, therefore, although this aspect may be complex in practice, it is important to consider how actors can support existing health systems (61).

1.4 Evidence gaps and research aims

1.4.1 Evidence gaps

It is clear that primary health care holds an important place in service delivery in humanitarian emergencies. Yet, much remains unclear and unknown about this topic.

There is a pressing need to:

a. Understand how primary health care is defined by different actors providing health services in humanitarian emergencies.
b. Understand how primary health care services are delivered in humanitarian emergencies.
c. Understand how the principles of primary health care apply in humanitarian emergencies.
d. Determine how international actors should work within the health system of countries and with affected communities to deliver person-centred primary health care.

1.4.2 Research aims

The scope of this thesis is to address a, b, c, and d above. The specific aims are to:

1. To review the literature on PHC interventions delivered during the acute phase of humanitarian emergencies.
2. To illustrate the components and principles of primary health care as they apply to humanitarian emergencies.
3. To develop a conceptual framework for PHC service delivery by international actors in humanitarian emergencies.
4. To describe the implications of this work for future research and practice.

1.5 Thesis structure

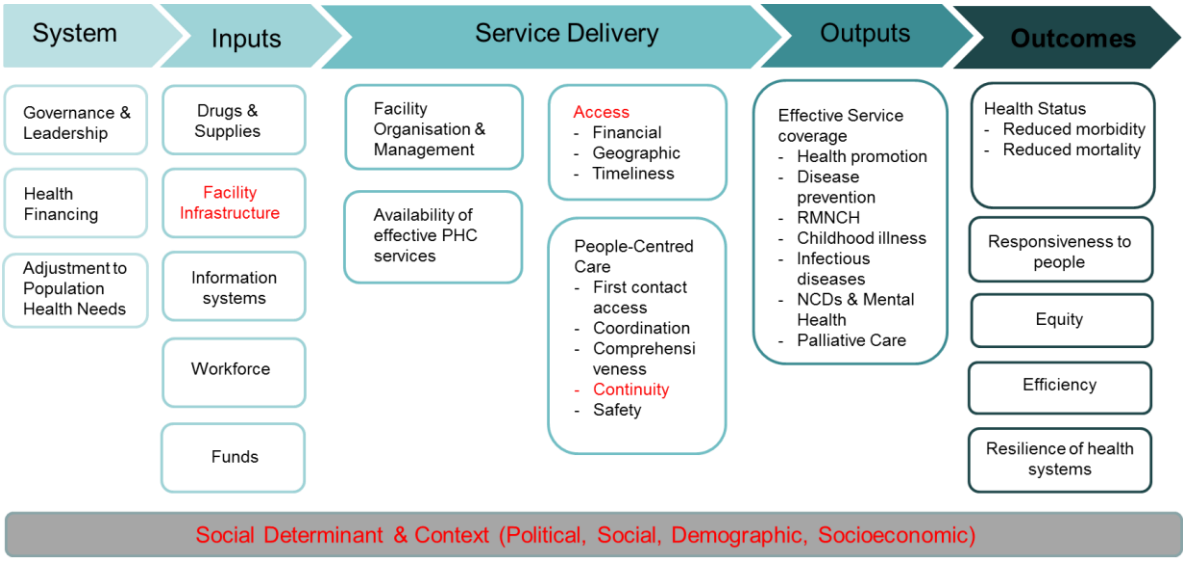
1.5.1 Systems framework

Acknowledging that international actors working in humanitarian emergencies operate within existing health systems, in this thesis, I consider my research topic through a health systems lens. To do this, I used a conceptual framework developed by the Primary Health Care Performance Initiative (PHCPI). The PHCPI is a partnership founded in 2015 by the Bill & Melinda Gates Foundation, the World Health Organization and the World Bank Group in collaboration with Ariadne Labs and Results for Development (70). The conceptual framework developed by this group describes the important components of a strong primary health care system, based on evidence about key characteristics and determinants of strong PHC systems (71).

The PHCPI conceptual framework is particularly tailored to the health systems of low and middle-income countries and was developed using 40 different existing frameworks (71). The framework, shown in Figure 1.2, includes 'System' level factors such as governance and leadership and health financing, 'Inputs' into the health system such as drugs and supplies, workforce and facility infrastructure and the 'black box' of service delivery which includes the key principles of PHC such as comprehensiveness of care, continuity of care, first-contact access, coordination and an additional element of safety. These factors are thought to contribute to the output of effective service coverage, leading to the various outcomes of reduced morbidity and mortality, responsiveness to people, equity, efficiency and resilience of health systems. The framework acknowledges that this PHC system lies within a larger health system, which itself lies within wider political, cultural, demographic and socioeconomic contexts (71).

In this thesis, I consider the elements of 'context', the input component of 'facility infrastructure', and the service delivery components of 'access' and 'continuity of care'. These elements were chosen as focus areas due to their relevance to my case studies on Nigeria and Lebanon.

Figure 1.2: Primary Health Care Performance Initiative conceptual framework for performance of a primary health care system *



* Elements highlighted in red text are the focus of the case studies in this thesis

Figure adapted from Primary Health Care Performance Initiative Methodology Note, available from: https://improvingphc.org/sites/default/files/PHCPI%20Methodology%20Note_0

1.5.2 Thesis outline

This thesis is composed of nine chapters. Chapter 1 (this chapter) has described the context within which this research has been conducted, provided background on primary health care, humanitarian emergencies, and described the evidence gaps and research aims that will be addressed throughout the remainder of the thesis.

Chapter 2 addresses the first research aim. It contains a scoping literature review of the published and unpublished evidence on primary health care interventions in humanitarian emergencies. In this chapter, I examined the available evidence on PHC service delivery by international actors in the acute phase of a humanitarian emergency, determined how PHC is defined by various international actors in natural disasters and conflicts, and described how the PHC system as a whole is affected during a humanitarian emergency.

Chapter 3 presents a methodological overview of the methods I have utilised in analysing the various components of the primary health care system, as investigated in Chapters 4, 6 and 7. The overall approach is that of multimethods research. Briefly, multimethods research is a methodological approach where numerous methods are employed to explore a particular research topic (72). Specifically, I used qualitative methods including focused ethnography, thematic analysis, content

analysis and realist inquiry, quantitative methods including descriptive and analytical epidemiology, and geospatial analytical methods.

In Chapter 4, I address the second research aim by analysing the concept of *context,* as it applies to a MSF maternal health care project in northern Nigeria. During my PhD candidature, I spent four weeks on this project in a non-operational role. As described in the PHCPI framework, health systems including at primary and secondary health care levels, lie within wider political, cultural, socioeconomic and other contexts. In this chapter, I used various qualitative methods to understand the contextual factors operating within this setting and project which are likely to have had an impact on the project's outcomes.

Chapter 5 provides a general overview of another field visit to a MSF project in the Bekaa valley region of Lebanon, where I spent three months working as a medical team leader during my PhD. In the Bekaa valley region, MSF has been providing comprehensive primary health care to Syrian refugees and Lebanese in the towns of Baalbeck, Majdal Anjar, Arsal and Hermel since 2012. This chapter provides background to the research presented in Chapters 6 and 7.

Chapters 6 and 7 also address the second research aim by exploring two key aspects of health service delivery in a PHC system. These chapters are based on the analysis of patients with NCDs presenting to four MSF primary health care clinics in the Bekaa valley. In Chapter 6, I explored the concept of *access,* in particular, geographic accessibility and availability of facility infrastructure using geospatial analytical methods. In Chapter 7, I investigated the principle of *continuity of care* by describing this group of NCD patients and examining characteristics of those who stayed in care for six months or longer.

Chapter 8 presents a conceptual framework for PHC service delivery by international actors in a humanitarian emergency. I drew on the findings of the previously described case studies and used theoretical underpinnings of complex adaptive systems theory and the WHO framework on integrated people-centred health services to develop this conceptual framework.

Finally, Chapter 9 presents a summary of the key research findings of the thesis and provides an integrated discussion of the policy implications of these findings. Future research priorities were identified and strengths and limitations of the thesis discussed, prior to brief concluding remarks.

1.6 Practitioner-based research

My work with MSF and a passion for PHC led me to this PhD topic. Prior to undertaking this PhD, I worked as a medical doctor and medical team leader with MSF on four separate missions. My first MSF mission was to South Sudan in 2012, where I was responsible for the oversight of primary and secondary care activities in the remote village of Agok, on the border of Sudan and South Sudan. I then worked as medical team leader at Domiz refugee camp in northern Iraq, overseeing the activities of the only primary health care clinic providing care for Syrian refugees in the camp. Soon after Iraq, I was involved in the emergency response to Typhoon Haiyan in 2013, the largest typhoon to hit the Philippines. This response involved providing emergency primary and secondary care in the towns of Tacloban, Tanauan and Talosa, which were most affected by the typhoon. Then, between November and December 2014, I was involved in the response to the Ebola outbreak in West Africa where we set up an Ebola transit centre in Monrovia, Liberia.

The research underlying this thesis was conducted with the support of MSF, in as much as MSF provided access to field projects and corresponding data and covered the cost of travel to field sites. The PhD was otherwise funded by a scholarship from the Australian Government's Research Training Program.

Given the complicated and unpredictable nature of conducting research in humanitarian settings, the field projects included in this PhD were those that were the most pragmatic and suitable for research. In the fieldwork conducted in the Bekaa valley in Lebanon, I worked in an operational role as medical team leader and was granted permission to analyse routinely collected data in this project. My role in the field visit to the MSF project in northern Nigeria was as a field epidemiologist. From MSF's perspective, both the visits to Lebanon and Nigeria fulfilled operational objectives, rather than research objectives per se.

In conducting this research, I have had the opportunity to use the experience and knowledge gained from my work with MSF and combine it with validated research methods to develop this thesis. However, it is necessary to declare that this may have also resulted in potential biases. Such biases may include experience working only with MSF in humanitarian settings (thereby generalising and applying lessons learnt from MSF to other humanitarian agencies), unconscious biases in interpreting and analysing results, and having access to internal MSF documents and conversations which are not generally accessible. Nevertheless, the dual role of being a humanitarian practitioner and researcher has allowed me to gain invaluable insights into this topic which would not have otherwise been possible.

Chapter 2 Literature Review

2.1 Preamble

This chapter presents a scoping literature review of the peer-reviewed and grey literature pertaining to the delivery of primary health care (PHC) services by international humanitarian actors in the acute emergency phase of a humanitarian emergency. The information is summarised according to three research aims, based on: 1. the definition of PHC in humanitarian emergencies as evidenced by the way in which PHC services are delivered by international humanitarian actors, 2. the method of PHC service delivery in conflicts and natural disasters and 3. a description of how major elements of a PHC system are affected during a humanitarian emergency.

2.2 Introduction

The definition of PHC has undergone many interpretations since the Alma Ata Declaration of 1978. Today, there is no uniform, universally understood definition of PHC (58). In high- and middle-income countries, it is mainly understood to be the first level of care (58). In low-income countries where significant challenges in access to health care persist, PHC is seen more as a system-wide strategy (58). Primary health care, as currently defined by the WHO involves three core components: 1. primary care and essential public health functions as the core of integrated health services, 2. multisectoral policy and action, and 3. empowered people and communities, as advocates for policies that promote and protect health and well-being and as co-developers of health and social services (35).

Implicit to the concept of PHC is an approach to health services delivery. A central tenet of this approach has always been the inclusion and involvement of communities receiving health services. In the Declaration of Alma Ata in 1978, when PHC was first conceptualised, it was stated that “the people have the right and duty to participate individually and collectively in the planning and implementation of their health care” (14). Forty years later, in the Declaration of Astana of 2018, there was an affirmation of this statement when all 192 member countries of the United Nations vowed “to support the involvement of individuals, families, communities and civil society through their participation in the development and implementation of policies and plans that have an impact on health” (15).

In humanitarian settings, the Sphere guidelines are the most commonly cited standards for humanitarian action (73, 74). These guidelines were first established in 1996 to provide a minimum

set of technical criteria for humanitarian intervention (73, 74). Primary health care is not clearly defined in the Sphere guidelines, described simply as "household and community care" (61).

The guidelines infer that this level of care depends on the context and may range from prevention programs to health promotion or case management (61). It suggests that access to PHC may be through community health workers (CHWs) or volunteers, peer educators, or in collaboration with village health committees to increase patient and community engagement (61). However, they do not provide further guidance on how these services may be delivered, adapted to the context nor indicate the essential requirements for PHC service delivery by international actors.

One of the key actions outlined for health service delivery in the Sphere guidelines is to provide health services at the appropriate level of the health system – household and community, clinic or health post, health centre and hospital (61). Health care is suggested to be delivered through a combination of community level, mobile and fixed healthcare facilities (61). The guidelines provide recommendations for the minimum level of health facilities required for a population – for example, a health post for every 10,000 individuals and suggests that mobile clinics may be considered to reach people in hard-to-reach locations (61).

The Sphere guidelines also acknowledge that a health systems approach will "progressively realise the right to health during the crisis and recovery" (61, page 293), therefore it is important to consider how humanitarian actors can support existing health systems (61). In addressing the health system aspect, these guidelines refer to the commonly accepted health system framework developed by the WHO (61), which describes six core components or 'building blocks' of a health system (75). These building blocks are: service delivery, health workforce, health information systems, access to essential medicines, financing, and leadership/governance (75). These factors are thought to contribute to the strengthening of health systems in different ways (75). Further critical analysis of the components of a health system are described in subsequent chapters.

To support and strengthen a health system affected by a humanitarian emergency, it is necessary to understand how the health system has been affected by the emergency. While it has been commonly stated in articles and case reports that health systems are affected during humanitarian emergencies (76-81), there are no evidence syntheses on this topic and specifically, there is no evidence on how PHC systems are affected in humanitarian emergencies. Further, while the Sphere guidelines provide some description of the kinds of services that may be provided at the community-level and by whom, there is no further elaboration of PHC service delivery from a health systems perspective or a consideration of how key PHC principles such as continuity of care, comprehensiveness, coordination and first-contact access may apply in such settings.

For these reasons, I conducted a scoping review to systematically map the existing knowledge on this topic and to identify any existing gaps in knowledge. Scoping reviews are a relatively new but increasingly common approach for mapping broad topic areas (82). This review was guided by the question, "What is known from the literature about PHC service delivery by international actors in the acute phase of a humanitarian emergency due to conflict or natural disaster?" The rationale to study the acute phase of the emergency was due to the immense need for health services in this important phase, and the opportunity for successful intervention. Also, while there is some literature on PHC during the post-conflict and recovery phases of a humanitarian emergency (76, 83-87), there is little published on service delivery during the acute phase. I chose to focus on conflicts and natural disasters as these are both significant causes of humanitarian emergencies (1, 18). For the rest of this chapter, the term humanitarian emergency will be specific to those due to conflicts and natural disasters.

The specific aims of this review were to firstly, understand how PHC is defined by different international actors providing PHC services in humanitarian emergencies. Secondly, to understand how PHC services are delivered by international actors in different types of disasters – limited to natural disasters and conflicts. A final aim was to investigate and describe how the PHC system is affected during a humanitarian emergency, and how this affects service provision by international humanitarian actors. The literature review aims to provide an integrated view of the available evidence.

2.3 Methods

In conducting this scoping review, I followed the methodological framework outlined by Arksey and O'Malley (88), a commonly used framework for this type of review (82). The phases of the review included: 1. Identifying the research question, 2. Identifying relevant studies, 3. Study selection, 4. Charting the data, 5. Collating, summarising and reporting the results. The optional 'consultation exercise' of the framework was not conducted. In 2018, the PRISMA extension for scoping reviews (PRISMA-ScR) was published (89). In reporting this review, I have followed these recommended guidelines.

2.3.1 Data sources and search strategy

I aimed to be comprehensive in identifying all studies relevant to the implementation of PHC services by international actors in the acute phase of a humanitarian emergency. To achieve this, the search strategy was threefold: 1. searching five electronic databases, 2. searching the domain names of key

humanitarian organisations using the Google Advanced search function, 3. searching the reference lists of articles included in the review as well as other relevant articles.

The initial search was conducted on 6 April 2016 in five electronic databases: MEDLINE/PubMed (biomedical sciences, 1946 to present), Web of Science (multi-disciplinary, 1900 to present), Proquest (multi-disciplinary, 1938 to present), Scopus (multi-disciplinary, 1823 to present) and the Cochrane Central Register of Controlled Trials (CENTRAL), including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (health services research, 1993 to present).

Due to the range of terms that are used to describe PHC and humanitarian emergencies, I kept the search terms purposefully broad to maximise the number of relevant studies that could be included in the review. The search strategy was developed in consultation with a health librarian at the Australian National University in March 2016. The strategy reflected three key areas of interest: studies related to primary health care, studies related to service delivery and studies related to humanitarian emergencies. The same search strategy was used in all search engines as follows: ("primary health care" OR "comprehensive health care" OR "integrated health care" OR "continuity of patient care" OR "ambulatory care facilities" OR "mobile health units" OR "community health centres" OR "community clinics" OR "maternal-child health centres" OR "outpatient clinics" OR "outpatients" OR "primary prevention") AND ("delivery of health care" OR "health service delivery" OR "health services") AND ("relief work" OR "disasters" OR "refugees" OR "disaster planning" OR "emergencies" or "war*"). I used the "explode" option to increase the depth of the search. In these databases, articles were limited to those published between 1978 (with reference to the Declaration of Alma Ata) and 29 February 2016. Due to a lack of resources for translation, articles published in languages other than English were excluded. No limits were placed on the type of article that could be reviewed. For the published literature, a 'snowball' technique was also adopted in which the reference lists of articles included in the review and other relevant articles were searched for additional references.

For the grey literature search, the Google Advanced function was used to search the domain names of key international humanitarian actors working in humanitarian emergencies as well as a research institution. The following agencies and domain names were searched: Médecins sans Frontières (MSF), msf.org; International Committee of the Red Cross (ICRC), icrc.org; International Federation of Red Cross and Red Crescent Societies (IFRC), ifrc.org; International Rescue Committee (IRC), rescue.org and the Overseas Development Institute's Humanitarian Practice Network (ODIHPN), odihpn.org. The following search terms used were used systematically in all these domains: "("primary healthcare" OR "primary health care") AND "intervention" NOT "reconstruction". The

World Health Organization's library database (WHO LIS) was also searched using the terms "primary healthcare" and "emergency". The grey literature search was limited to reports written in English between 1 January 2013 and 2 September 2018, to keep the results current and manageable to synthesise.

2.3.2 Citation management

All citations were imported into the bibliographic manager Endnote x7 (Clarivate Analytics, Philadelphia, USA), where duplicates were automatically removed. I removed further duplicates manually as they were found. I also screened titles and abstracts of articles for relevance using this software. The results from each of the internet-based searches were downloaded onto Microsoft Excel spreadsheets for further review.

2.3.3 Eligibility criteria

Screening for relevant studies followed a three-stage process, using the inclusion and exclusion criteria outlined in Table 2.1. Studies were eligible for inclusion if they broadly described the delivery of PHC services by international actors in the acute phase of a humanitarian emergency, occurring in low- and middle-income countries as defined by the World Bank in 2016 (90). Humanitarian emergencies were further restricted to those resulting from conflict or natural disaster. Articles reporting on humanitarian emergencies which were due *exclusively* to high levels of poverty, economic instability, a high percentage of underserviced population or unstable demographic dynamics were not included in this review. Further, articles describing only vertical, disease-oriented programs were excluded from the review as the focus of this review was on PHC service provision aiming to treat a person and not a disease.

For the first level of screening, I screened only the titles of articles, to ensure that time was not wasted in reviewing abstracts that did not meet the minimum inclusion criteria. A 20% sample of excluded titles was reviewed by a PhD supervisor (TH). The second level of screening was to review abstracts of articles that met the inclusion criteria. Final screening included full-text review, which was done by myself and by TH. Where there was uncertainty about articles even after review of the full article, these were resolved through discussion. When the same data were reported in more than one article (for example, a press release and an organisational report at two time points), only the article reporting the most complete data was used.

Table 2.1: Inclusion and exclusion criteria for articles related to primary health care service delivery in humanitarian emergencies

	Inclusion criteria	Exclusion criteria
Setting	Reports from the acute phase of a humanitarian emergency* (restricted to natural disasters and conflicts) in low- and middle-income countries	• Reports of international assistance in the predominant setting of high levels of poverty, economic instability or high proportion of underserved population • Reports describing emergency preparedness, post-conflict, recovery or re-building phases of a humanitarian emergency • Reports from high-income countries
Article type	Primary reports of interventions / service provision by international actors	• Secondary reports • Summary reports / commentaries on the topic
Intervention type	Health services provided in the community, or at the first point of contact with the health system (including in hospital facilities) where the intention is to treat the person and not a disease	• Services provided in hospitals for non-ambulatory conditions • Vertical, disease-oriented programs delivered at the community level • Articles with insufficient detail about service delivery • Reports of anticipated interventions
Population group	Populations affected by humanitarian emergencies	• Population not affected by humanitarian emergencies
Language	English	• Languages other than English
Time period	Peer-reviewed literature: 1 January 1978 to 29 February 2016 Grey literature: 1 January 2013 to 2 September 2018	• Outside of these time periods

* Defined as the period immediately after a disaster strikes or when known, a crude mortality rate > 1/10,000/day or under-five crude mortality rate > 2/10,000/day

2.3.4 Data extraction and synthesis

Full-text articles deemed relevant after the screening stage from the published literature were imported into the qualitative data analysis software program, NVivo version 11 (QSR International, Melbourne, Australia) for further analysis and coding. The data from the grey literature were compiled in a single Microsoft Excel 2010 (Microsoft Corporation, Washington, USA) spreadsheet. I extracted data from all the peer-reviewed and grey literature. Data from the peer-reviewed literature only was also extracted by TH.

Key themes and data from the literature were extracted according to the research aims. In order to understand how international humanitarian medical actors may define PHC, I used the current

definition of PHC used by the WHO, and looked for core aspects of this definition in the description of interventions. These core PHC aspects included: 1. provision of essential medical care, 2. performance of public health functions (such as disease surveillance, disease prevention, health education, etc.), 3. multi-sectoral action – for example, with sectors such as Water and Sanitation (WASH), Nutrition, Education or others relevant to PHC, and finally 4. community empowerment – defined as active participation by the community in decision-making for services delivered, for example by forming village health committees or other such governance structures. In synthesising the results of this aim, I grouped the articles by health service provider to summarise a common definition of PHC used by each actor.

For the second research aim of understanding how PHC services are delivered by international actors in natural disasters and conflicts, data were extracted onto a Microsoft Excel spreadsheet with variables for the author/organisation, year of publication, type of report, location and date of disaster, disaster type (natural disaster/conflict), method of service delivery (fixed health post, outpatient clinic at a secondary healthcare facility and/or mobile clinic) and health service provider. In synthesising the results, I grouped the articles according to the type of humanitarian emergency - natural disaster or conflict, and then described each article according to the above variables.

The final research aim was to identify how the PHC system is affected during a humanitarian emergency, particularly as it relates to service provision by international humanitarian actors. To assess the elements of the PHC system of affected countries reported in the literature, I used the conceptual framework developed by the Primary Health Care Performance Initiative (PHCPI) (71). While the WHO health system building blocks provide a general overview of the essential requirements for any health system, the PHCPI group have developed a more specific conceptual framework for an effective *primary health care system* (71). As shown in Figure 2.1, this evidence-based framework describes the important components of a strong PHC system, particularly for low- and middle-income countries (71). It describes important 'System' factors, Inputs and Service delivery components in order to achieve the intended Outputs and Outcomes. The framework acknowledges that this PHC system lies within a larger health system, which itself lies within wider political, cultural, demographic and socioeconomic contexts (71).

Figure 2.1: Primary health care Performance Initiative conceptual framework for performance of an effective primary health care system

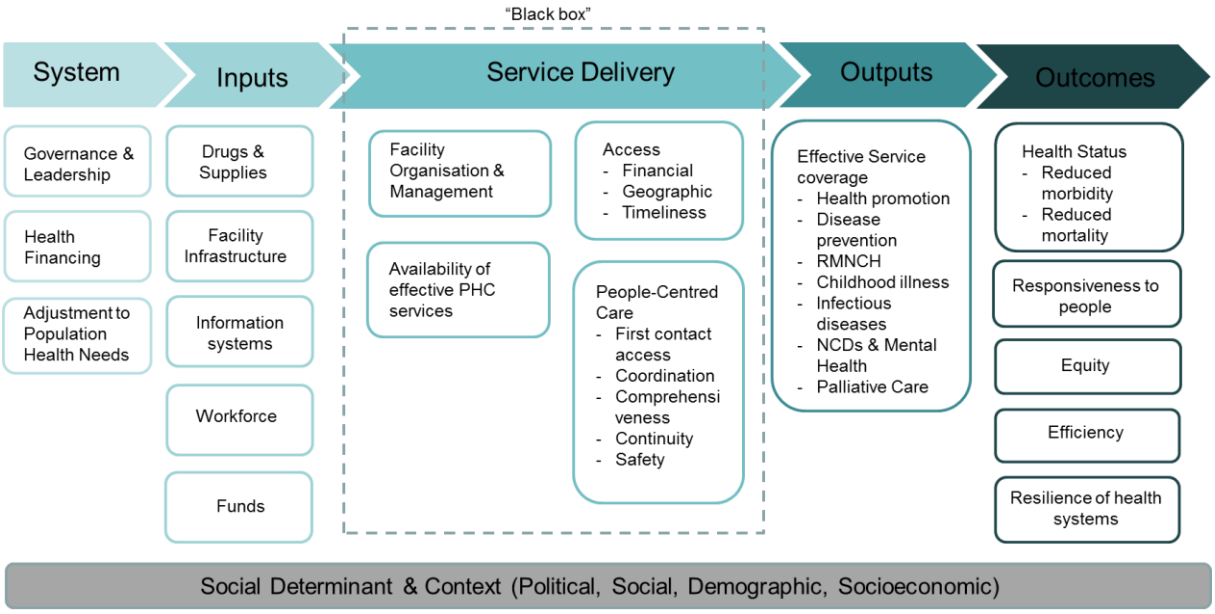


Figure adapted from Primary Health Care Performance Initiative Methodology Note, available from: https://improvingphc.org/sites/default/files/PHCPI%20Methodology%20Note_0

Due to the nature of articles reviewed and to limit the scope of the review, only some elements of this framework were examined. These elements and their definitions as they were used in this review are detailed in Table 2.2. Specifically, the components that were investigated were the 'Context', 'System'-level factors including governance and leadership and adjustment to population health, 'Inputs' which include drugs & supplies, facility infrastructure and workforce and the four key service delivery principles of PHC – first-contact access, continuity of care, comprehensiveness and coordination of care. The specific contextual factors that I considered were the social, political, cultural and economic factors within which PHC systems lie. I also considered other contextual factors relevant to the research aim as they emerged from the reviewed literature. In reporting this research aim, the findings were synthesised narratively, by system component.

2.3.5 Critical appraisal

Critical appraisal of individual sources of evidence falls outside the realm of scoping review methodology (89, 91). It is considered to be an optional feature which is performed if relevant to the objectives of the scoping review (89). Given the research aims of this review and the nature of studies included in this review, a formal critical appraisal of articles was not conducted.

Table 2.2: Key components of the primary health care system and their definitions as they were used in this review

System component	Definition	Reference
Context	Social, political, cultural, economic and other contextual factors emerging from the literature, within which the primary health care system lies	Adapted from the PHCPI methodology note (71)
System		
Governance & Leadership	Policies in place by international humanitarian actors on primary health care	Adapted from the PHCPI methodology note (71)
Adjustment to population health needs	Addresses the need for a system to monitor and adapt to population needs, including disease surveillance, priority setting and innovation & learning	PHCPI methodology note (71)
Inputs		
Facility infrastructure	Availability of facilities – number of facilities, mix of facilities and distribution	PHCPI methodology note (71)
Workforce	Trained and sufficient number of health personnel which is well-distributed geographically	PHCPI methodology note (71)
Drugs & Supplies	Availability of essential medicines, vaccines, commodities and equipment.	PHCPI methodology note (71)
Service delivery		
First-contact access	Includes both accessibility of a provider or facility and the extent to which the population uses the services when a need for them is first perceived	Starfield, 1994 (92)
Comprehensiveness	Providers offer a range of services broad enough to meet all the common needs of the population	Starfield, 1994 (92)
Coordination of care	Coordination of patient care throughout the course of treatment and across various sites to ensure appropriate follow-up	PHCPI methodology note (71)
Continuity of care	Person-focused care over time - relates to an ongoing therapeutic relationship between a patient and provider(s) (relational continuity)	Starfield, 1994 (92)

2.4 Results

The five database searches produced 12,049 citations from the peer-reviewed literature and the grey literature search produced 719 records across the five internet domains (Figure 2.2). After duplicates were removed, a total of 7603 titles were screened, of which 257 abstracts were reviewed for further eligibility. Of these, 95 full text articles were reviewed for inclusion. Fifty-eight articles were

excluded as they did not meet the inclusion criteria. There were a variety of reasons for exclusion: articles described interventions provided by a national service provider (13 articles), commentaries or review articles (11 articles), detail on service delivery was lacking (11 articles), services were not delivered in the acute phase of the emergency (ten articles), services were not at the primary health care / community level (seven articles), or they were not in English (six articles). In total, 37 articles were included in the review – nine articles from the database search and 28 from the internet search. The 28 articles found through the internet search were only from the IFRC and MSF domain searches.

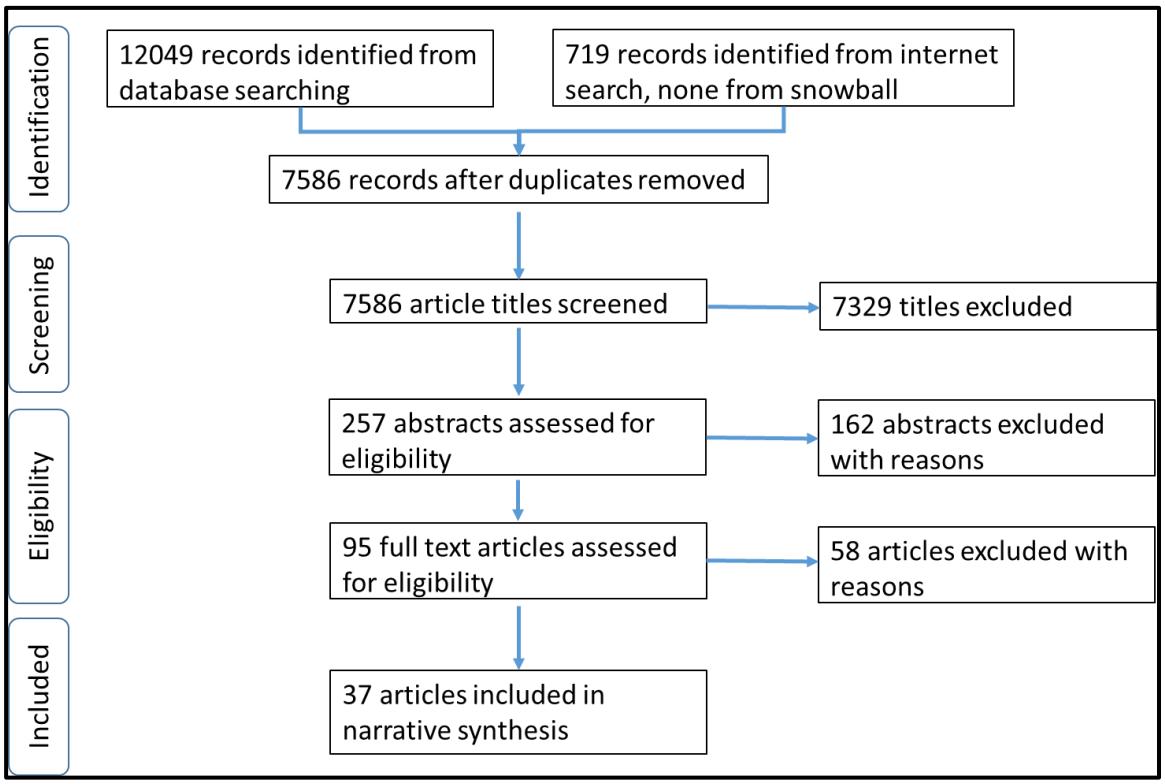
2.4.1 General characteristics of included articles

The general characteristics of the articles included in the review are reported in Table 2.3. Most articles are from the period 2007 to Sept 2018. However, this is because the majority of included articles were from the internet search which was limited to the period 2013 – 2 September 2018. Articles from the peer-reviewed literature ranged from 1983 to 2011.

The majority of included articles are reports from international non-government organisations (54%) such as international activity reports, project updates and crisis updates and with a smaller number (14%) from emergency appeals (these were all from the IFRC). Peer-reviewed publications represented 24% of included articles. Other reports included media releases and personal accounts.

The 37 articles included services provided by the following international humanitarian medical actors: 30 from iNGOs (20 from MSF, eight from IFRC, one from Save the Children Fund and one from Samaritans Purse/World Medical Mission), three from UN agencies which included one article from UNICEF and two from the United Nations Relief and Works Agency for Palestine Refugees (UNRWA), two articles with services provided by foreign medical teams, one from a military team and one article did not specify the service provider (further investigation of this article revealed that services were provided by an international actor).

Figure 2.2: PRISMA flowchart of article selection process



Of the 37 articles, 30 described PHC service delivery in the setting of conflicts and seven described it in the setting of natural disasters. These humanitarian emergencies were mostly located in the Eastern Mediterranean (38%) and African regions (32%), with the South-East Asian, European and Region of the Americas also being represented. Of the 30 articles reported in conflict settings, the majority (22 articles, 73%) were of reports in protracted conflicts. Eight articles reported on acute clashes or armed conflict – many of these were in the backdrop of chronic insecurity or violence.

Table 2.3: General characteristics of included articles in the scoping review of primary health care interventions in humanitarian emergencies, n = 37

Characteristic	Number of articles (%)
Publication year	
1978–1985	1 (3)
1986–1995	3 (8)
1996–2006	2 (5)
2007–Sept 2018	31 (84) *
Publication type	
Journal article	9 (24)
iNGO project report	20 (54)
Emergency appeal for funds	5 (93)
Personal accounts	2 (5)
Media release	1 (3)
Type of humanitarian emergency	
Conflict	30 (81)PHC
Natural disaster	7 (19)
Type of international medical actor	
iNGO	30 (81)
United Nations Agency	3 (8)
Foreign medical team	2 (5)
Military organisation	1 (3)
Does not mention	1 (3)
WHO region of intervention	
Eastern Mediterranean region	14 (38)
African region	12 (32)
South-East Asian region	6 (16)
European region	3 (8)
Region of the Americas	2 (5)

iNGO = International non-government organisation
***** This disproportionately high number is due to most included articles being retrieved from the grey literature search, which was limited to the 2013–2018 time period.

2.4.2 Research Aim 1: Definition of primary health care by international humanitarian actors

From the description of medical services provided and the approach to multi-sectoral action and community participation, it was evident that each of the agencies providing services at the community level defined and therefore approached the delivery of PHC in different ways. Table 2.4 summaries the ways in which PHC is defined by the different humanitarian actors represented in this review. This table however, is a simplistic representation of the extent to which different actors

considered different elements of PHC. For example, some actors had a very curative biomedical approach (63), while others such as the UNRWA acknowledged that although curative medical services are provided, the "UNRWA gives to curative medicine a lower priority than it does to preventive medicine" (94). Further, even within an organisation, not all aspects of PHC as described here, were covered in a single intervention – for example, for MSF, there was mention of multi-sectoral action in some interventions (95-97) and not others.

All organisations considered PHC to include at least the provision of essential medical care. Almost all organisations also included elements of public health function such as health education, disease prevention, disease surveillance and response and emergency preparedness. Again, the type and extent to which public health functions were included in an intervention varied between organisations. In the article on UNICEF's intervention in Ethiopia (98), the public health aspect included collecting health surveillance data, while in UNRWA-run health centres in Jordan, Lebanon, the West Bank and the Gaza Strip, the public health aspect included a strong emphasis on health education, including running regular campaigns, and disease prevention (94).

There was also consideration of, and/or collaboration with, other sectors relevant to health care by a majority of health organisations included in this review. The most commonly included sector was Water & Sanitation, while other sectors such as Nutrition, Shelter and Education were also considered by some agencies in some contexts. Some organisations provided WASH services themselves in the interventions described – for example IFRC, MSF and UNRWA, while others coordinated with other actors to ensure that these services were provided – for example, the United Nations High Commission for Refugees (99) in Somalia (98) and the United States military (100) in Sri Lanka.

The aspect of PHC which was least considered by humanitarian actors was community empowerment. None of the included articles described individuals or community members contributing to the design of PHC services or being actively involved in decision-making. There was, however, varying degrees of involvement of community members in some interventions by some organisations. For example, country Red Cross and Red Crescent Societies in all settings involved the community in the disaster response by recruiting and training local community members to deliver health education messages and demonstrations, participate in social cohesion activities and deliver relief items to the community (101-108). In the floods in Balochistan, the Pakistani Red Crescent Society mentioned the establishment of a complaint handling and feedback mechanism to provide a mechanism for social accountability and provide beneficiaries the opportunity to register their complaints and provide feedback about services (108). Save the Children's response in Thailand, where services were provided to Laotian refugees in a refugee camp setting, included traditional

therapy as part of the package of services (29). Emphasis was placed on refugees providing their own services and included Laotian refugee traditional healers. In the intervention by UNICEF for Ethiopian refugees in Somalia and internally displaced persons in Ethiopia, refugees and internally displaced persons were trained as community health workers and involved in providing nutritional surveillance and supplementary centre supervision (98). MSF also described using community health workers and community-based health care activities in some settings (97, 109).

Table 2.4: Definition of primary health care by various international humanitarian actors in humanitarian emergencies, 1983–2018

Author / Organisation, date(s) of publication	Type of organisation	Essential medical care	Public health functions *	Multi-sectoral action (with sectors such as Water & Sanitation, Shelter, Nutrition, Education)	Community empowerment
MSF, 2013–2018	iNGO	✓	✓	✓	DNM
IFRC, 2013–2018	iNGO	✓	✓	✓	DNM
Broach et al, 2010	Foreign medical teams	✓	DNM	DNM	DNM
Lane, 2006	US Military	✓	✓	✓	DNM
Bremer, 2003	Various INGOs (un-named)	✓	✓	✓	DNM
Maybin, 1992	Save the Children	✓	✓	✓	DNM
Henderson and Biellik, 1983	UNICEF	✓	✓	✓	DNM
Lilienfield et al, 1986, Sabatinelli et al, 2010	UNRWA	✓	✓	✓	DNM
Qayum et al, 2011	DNM	✓	✓	DNM	DNM
Van Rooyen et al, 1995	Samaritans Purse/World Medical Mission	✓	✓	DNM	DNM

MSF = Médecins sans Frontières; IFRC = International Federation of Red Cross & Red Crescent Societies; iNGO = International non-government organisation; DNM = does not mention

* Includes health education, disease prevention, disease surveillance and response, emergency preparedness

2.4.3 Research Aim 2: Mode of primary health care service delivery based on type of emergency

To describe how PHC services were delivered by type of emergency, I grouped reports according to natural disasters and conflicts, described below. The main methods of PHC service delivery were mobile clinics, fixed health posts and outpatient departments of secondary healthcare facilities.

2.4.3.1 ***Natural disasters***

Seven articles reported on PHC interventions delivered during natural disasters, occurring between 2001 and 2017 (Table 2.5). Of the natural disasters reported, two were of earthquakes (63, 110), three were of floods and landslides (103, 104, 108), one was of a tsunami (100) and one was of a drought (107). These natural disasters were pre-dominantly located in the Asian countries of India, Pakistan, Sri-Lanka and Bangladesh (100, 103, 108, 110). There were natural disasters also reported from Central America (Haiti), South America (Colombia) and Africa (Somalia) (63, 104, 107). Organisations providing services in this setting included the IFRC (103, 104, 107, 108), the United States military (100) and foreign medical teams (110). In all seven reports of natural disasters, the predominant mode of PHC service delivery was mobile clinics. Two of the seven articles reported delivering services via fixed health posts, in addition to mobile clinics (Table 2.5).

2.4.3.2 ***Conflict***

There were 30 articles which reported on PHC services delivered in conflict settings, dating in publication date from 1983 to 2018 (Table 2.6). The majority of reported conflicts were from the African continent – 11 reports from seven conflicts (Somalia, Central African Republic, South Sudan, Nigeria, Mali and the Democratic Republic of Congo), 11 reports from three conflicts in the Middle-East region (Arab/Israel conflict, Syria and Iraq), five reports from three conflicts in Asia (Pakistan, Laos and Yemen) and three reports from one conflict in eastern-Europe (Ukraine).

Health service providers represented in these reports were predominantly MSF (20 reports), IFRC (four reports), UN agencies (three reports), Save the Children (one report), Samaritan's Purse/World Medical Mission (one report) and one report did not mention the service provider (although further independent verification confirmed that services were provided by an international NGO). In this setting of conflict, services were predominantly delivered through a combination of fixed health posts and mobile clinics (12 articles), eight reported using mobile clinics only, seven articles reported delivering services via fixed health posts only, two reported using a mixture of mobile clinics, fixed health posts and an outpatient clinic in a hospital and one reported delivering services using a combination of fixed health post and an outpatient clinic in a hospital (Table 2.6).

Table 2.5: Articles describing primary health care provision by international medical actors during natural disasters, 1978–2018

Article	Type of article	Type of natural disaster	Date of emergency	Country of intervention	Organisation(s) providing services	Service delivery method
Broach et al, 2010	Description of intervention	Earthquake	12 January 2010	Haiti	Medical staff from USA and Dominican Republic	Mobile clinics in internally displaced camps
Lane, 2006	Description of intervention	Tsunami	Dec 26 2004	Sri-Lanka	US Military	Mobile clinics in internally displaced camps
Bremer, 2003	Evaluation of relief intervention	Earthquake	26 January 2001	India	Various - foreign medical teams and local health staff	Fixed health posts and mobile clinics
IFRC, Emergency Plan of Action Pakistan: Balochistan Floods/Snowfall, 2017	Emergency plan of action report	Floods	17 – 22 January 2017	Pakistan	IFRC	Mobile health teams to three affected districts
IFRC, Emergency appeal operation update Bangladesh: Floods and Landslides, 2013	Emergency appeal operations update	Floods and landslides	June 2012	Bangladesh	IFRC	Mobile medical teams for 1 month
IFRC, DREF Final Report Colombia: Mudslide, 2017	Disaster Relief Emergency Fund final report	Mudslide	31 March 2017	Colombia	IFRC	30 mobile health units over 3 months
IFRC, Emergency Appeal Revision Somalia: Complex Emergency, 2017	Emergency appeal	Drought	August 2015	Somalia	IFRC	Mobile clinics in the first year then fixed health posts

IFRC = International Federation of Red Cross & Red Crescent Societies

Table 2.6: Description of articles describing PHC provision by international actors in the setting of conflicts

Article	Type of article	Country of intervention	Date and brief description of conflict	Organisation providing services	Service delivery method and setting
Peer-reviewed literature					
Van Rooyen et al, 1995	Description of intervention	Somalia	1991 civil war in Somalia	Samaritan's Purse and World Medical Mission	MCs in urban and rural Somalia
Lilienfield et al, 1986	Evaluation of UNRWA services	Various - Jordan, Lebanon, Syria, West Bank, Gaza strip	1948 Arab-Israeli war	UNRWA	FHCs in refugee camps in 5 countries
Qayum et al, 2011	Descriptive, Cross-sectional assessment of health facilities	Pakistan	1980 – 2000s conflict in Afghanistan and Pakistan	Does not mention	FHC in refugee camp
Henderson and Biellik, 1983	Comparative analysis of health relief in Somalia and Ethiopia	Ethiopia	1980, conflict and drought in the Ogaden region of southern Ethiopia	UNICEF	FHC in refugee camps
Sabatinelli et al, 2010	Description of intervention	Various - Jordan, Lebanon, Syria, West Bank, Gaza strip	1948 Arab-Israeli war	UNRWA	FHC in refugee camps in 5 countries
Maybin, 1992	Retrospective record review	Thailand	1975 – 1989, civil conflict in Laos	Save the Children Fund UK	FHC in refugee camp
Grey literature					
MSF, MSF starts an emergency intervention in Kouango amid 'a terrible mix of violence, displacement and lack of basic healthcare', 2015	Press release	Central African Republic	2014, acute conflict	MSF	MCs for IDPs[##]

Article	Type of article	Country of intervention	Date and brief description of conflict	Organisation providing services	Service delivery method and setting
MSF, Iraq: Crisis Update - 29 June 2017	Crisis update	Iraq (northern)	2017, acute conflict in Mosul	MSF	MCs for internally displaced & FHCs in camp
MSF, International Activity Report 2016: Myanmar, 2016	International activity report	Myanmar	2016, acute conflict in Kachin and Shan states	MSF	MCs & FHCs for IDPs
MSF, Crisis Update - northern Iraq, June 2017	Crisis update	Iraq (northern)	2016, acute conflict in Hawija	MSF	MCs for internally displaced & FHC
MSF, International Activity Report 2017: Lebanon, 2017	International activity report	Lebanon	2011, protracted Syrian conflict 1948, protracted Palestinian conflict	MSF	FHC in Palestinian refugee camp & FHC for Syrian refugees
MSF, International Activity Report 2017: South Sudan, 2017	International activity report 2017	South Sudan	2013, protracted civil conflict	MSF	MCs including on boats & FHC for internally displaced
MSF, International Activity Report 2017: Syria, 2017	International activity report 2017	Syria	2011, protracted civil conflict	MSF	MCs & FHCs
MSF, There is a lack of humanitarian actors in Baghdad area, 2016	Personal account	Iraq (central)	2015, protracted civil conflict	MSF	MCs & FHCs
MSF, International Activity Report 2017: Myanmar, 2017	International activity report 2017	Myanmar	2009, protracted ethnic conflict	MSF	MCs & FHCs
MSF, MSF outreach clinic a vital lifeline for eastern rural areas, 2014	Personal account	Ukraine (111)	2014, acute armed conflict	MSF	MCs across five villages

Article	Type of article	Country of intervention	Date and brief description of conflict	Organisation providing services	Service delivery method and setting
MSF, Syria Crisis Update - October 2015	Crisis update	Syria	2011, protracted civil conflict	MSF	OPD in hospital & FHCs
MSF, Caring for villagers trapped near frontlines in Optyne, 2018	Project update	Ukraine (111)	2014, acute armed conflict	MSF	MC to village in frontline
MSF, One year after the battle, medical needs remain high in Arsal, 2018	Project update	Lebanon	2011, protracted Syrian conflict	MSF	FHP in isolated town
MSF, South Sudan Crisis Update, August 2014	Crisis update	South Sudan	2013, protracted civil conflict	MSF	MCs, OPD in hospital, FHC in IDP camp and outside of camp
MSF, International Activity Report 2016: Nigeria, 2016	International activity report 2016	Nigeria	2009, protracted civil conflict	MSF	MCs, FHCs in IDP camps
MSF, New maternity clinic ensures women deliver safely in Tal Maraq in the northwestern district of Tal Afar, 2017	Project update	Iraq (northern)	2015, acute conflict in Tal Afar district	MSF	MCs in Tal Afar district
MSF, International Activity Report 2016: Yemen, 2016	International activity report 2016	Yemen	2015, protracted civil conflict	MSF	MCs around IDP camps + FHCs
MSF, MSF gains access to town devoid of healthcare, 2013	Project update	Mali	2013, acute conflict in northern Mali	MSF	MCs & FHCs
MSF, International Activity Report 2017: Niger, 2017	International activity report 2017	Niger	2014, protracted conflict in Nigeria	MSF	MCs & FHCs

Article	Type of article	Country of intervention	Date and brief description of conflict	Organisation providing services	Service delivery method and setting
MSF, Borno State crisis update - November 2017	Crisis update	Nigeria	2009, protracted conflict	MSF	MCs, FHCs in IDP camps & OPD in hospital
IFRC, Emergency Plan of Action Niger: Population Movement, 2015	Emergency plan of action	Niger	2014, protracted conflict in Nigeria	IFRC	MCs over 3 months
IFRC, Emergency Appeal Operations Update Niger: Population Movement, 2016	Emergency appeal operations update	Niger	2014, protracted conflict in Nigeria	IFRC	MCs
IFRC, Emergency Appeal Revision Ukraine: Complex Emergency, 2016	Emergency appeal revision	Ukraine (111)	2013, protracted civil conflict	IFRC	MCs to six regions and temporary camps
IFRC, Revised Emergency Appeal Syria: Complex Emergency, 2013	Revised emergency appeal	Syria	2011, protracted civil conflict	IFRC	MCs + FHCs

UNRWA = United Nations Relief and Works Agency for Palestinian Refugees; UNICEF = United Nations International Children's Emergency Fund; MSF = Médecins sans Frontières; IFRC = International Federation of Red Cross & Red Crescent Societies; MC = mobile clinic; FHC = fixed health centre; OPD = outpatient department; IDP = internally displaced persons

2.4.3.3 ***Fixed health centres and mobile clinics for primary health care service delivery***

In general, fixed health centres were predominantly used in the setting of refugee or internally displaced persons (IDP) camps (29, 94, 97, 98, 112-117) and in contexts which were relatively secure. Mobile clinics were used in both conflict and natural disaster settings. In both these settings, they were used for the purpose of accessing populations. However, a key difference between the use of mobile clinics for natural disasters and conflicts was the purpose for which they were used in that context. In all articles, it appeared that the primary objective for using mobile clinics in natural disasters was to deliver health care as quickly as possible to reduce immediate health risks caused by the natural disaster. They were also used to access populations where insecurity and damaged roads meant that people could not come to fixed health centres (104, 108), and to reach people living in temporary, makeshift camps (103).

In settings of conflict, mobile clinics were used less for efficiency of service delivery and more to gain access to affected populations. Mobile clinics were used in areas of intense fighting or insecurity to access populations affected by a lack of functional health services or an inability to reach fixed health centres (97, 101, 105, 115, 118-121), or where there were large numbers of people displaced by fighting (96, 109, 118, 119, 122). Mobile clinics were also used to reach populations in remote villages or hard-to-reach areas including remote opposition-held areas (96, 97, 101, 106, 109, 114, 120, 122-124). Some articles also reported using mobile clinics for the flexible approach it provided, where services could be provided according to population movements and arising needs – for example, at transit points, checkpoints and screening sites (95, 125). A couple of articles also commented that mobile clinics were beneficial for health surveillance - to monitor the health situation of refugee and host populations. For example, in Somalia, mobile clinics were sent to monitor areas known to be at-risk for acute watery diarrheal outbreaks and severe acute malnutrition (97, 107).

While mobile clinics were seen to have advantageous aspects, a couple of authors commented on poor coordination of mobile clinics and poor communication with affected villages. Bremer commented that mobile clinics were not organised properly after the earthquake in India such that many villages did not receive the needed relief (110), while Broach commented that due to population movement after the earthquake in Haiti, the affected population were not aware of a medical teams' arrival (63).

2.4.4 Research Aim 3: Investigating how the primary health care system is affected by humanitarian emergencies

In investigating how the elements of the PHC system were affected during the acute phase of a humanitarian emergency, I considered the following PHC system elements: 1. contextual factors, 2. system-level factors including governance and leadership and adjustment to population health needs, 3. inputs to the system including drugs & supplies, workforce and facility infrastructure, and 4. key principles of PHC service delivery – first-contact access, comprehensiveness, coordination of care and continuity of care. These were all considered from the perspective of international humanitarian actors and the manner in which these impacted on service delivery is described in further detail below.

2.4.4.1 ***Context***

While the focus of the review was on how the PHC system is affected *during* an emergency, it became apparent that it is important for international actors to understand the contextual factors of a disaster-affected country even before the emergency occurred. The literature highlighted that these pre-emergency contextual factors can affect the way PHC services are delivered by international actors during the disaster. Therefore, this section is divided into 'pre-emergency' and 'during-emergency' contextual factors.

Pre-emergency

From the reviewed literature, pre-emergency factors which affect PHC service delivery by international actors relate to: 1. the wider determinants of health – the social, political and economic factors in which health systems are placed, 2. the pre-existing state of the affected country's health system and its capacity to respond to a disaster, and 3. the natural environmental of places in which disasters occurred.

A small number of articles discussed **existing social factors** such as the language, culture, religion and traditions of the affected country as important considerations for PHC delivery by international actors, which have the potential to add to the complexity of the response (29, 100, 110, 116). Bremer stated that in the 2001 earthquake affecting the Gujarat state in India, there were more than 40 different tribes with different cultures, languages and tradition (110). Therefore, a consideration of the needs of these various cultural groups was required (110). Similarly, Lane, Qayum and Maybin commented on the ethnic composition of the disaster-affected populations in Sri-Lanka, Pakistan and Laos/Thailand, respectively (29, 100, 116), and the impact this had on planning services during the disaster, namely that there was a requirement to consider the need for translators, consider the

gender of health service providers (for example female providers for female patients) (116), or the inclusion of traditional medical practices (29).

The **level of economic development of a country** was another factor which had an impact on PHC service delivery, particularly in relation to the way poverty affected an individual's 'pre-disaster health status' (63, 96, 98, 103, 110, 118). For example, Broach commented that prior to the 2010 earthquake in Haiti, only 58% of the population had access to improved drinking water sources and that only 19% had access to improved sanitation (63). He suggests that the "pervasive poverty in Haiti" may have contributed to residents being unable to leave the city after the 2010 earthquake (63). Lane commented that the area of intervention by the US military after the south-east Asian tsunami of 2004, was "socioeconomically under-developed and medically underserved" before the tsunami (100), affecting resident's health status. Bremer reported that 70% of the resident population affected by the earthquake in India were poor peasants with limited access to health services compared to more urbanised parts of India (110).

The level of economic development of a country is closely linked to its **pre-existing health system before an emergency** and its corresponding capacity to respond. For example, Broach suggests that the impact of the earthquake in Haiti was greatly compounded by the lack of health infrastructure and limited social services in Port-au-Prince even before the earthquake struck (63). Prior to the earthquake, only an estimated 60% of Haitians had access to any formal health care (63). In countries such as South Sudan, the Democratic Republic of Congo, Central African Republic and northern parts of Nigeria, access to health care was very limited or non-existent prior to conflict; iNGOs were sometimes the only health actors present (96, 97, 115, 118, 126). For example, in South Sudan, more than 80% of medical services are reportedly provided by international organisations (97). In addition, in some circumstances, those seeking refuge are going to countries with an already strained health system – for example northern Nigerians seeking refuge in Niger (101, 114, 115).

Even in countries which are more developed, governments may not have well-established PHC policies or weaknesses in health system infrastructure may mean that the PHC system does not function effectively (105, 110, 113, 127). Bremer noted that India had an excellent infrastructural layout for the delivery of PHC services, however it was reported that this structure does not work effectively due to limited resources, communication delays, poor management and lack of political will (110). In Lebanon, as a result of conflicts in neighbouring countries and an influx of refugees, more than a quarter of Lebanon's population is made up of refugees, putting an immense strain on the country's health services (113, 127, 128). All these factors affect the capacity of the national health system to respond to a disaster and increases its dependence on international humanitarian organisations for health care provision.

In addition to the above-mentioned factors, another important but perhaps overlooked contextual factor is the **natural environment** in which disasters occur, which can affect service delivery by interactional actors. Some areas affected by disasters have a natural vulnerability to weather patterns such as droughts, floods and heavy rain which have an impact on the affected populations and on service delivery (97, 101, 103, 107, 115, 118, 120). In countries like South Sudan and Central African Republic, Niger and northern Nigeria, roads are impassable during the annual rainy season, particularly in remote parts of the country, cutting off supply chains and hampering service delivery (97, 101, 115, 118). In Ukraine, heavy snow had the same effect (120).

Environmental conditions also worsened the impact of the disaster and contributed to health problems among the disaster-affected population. In IDP camps in South Sudan, South Sudanese were said to be living in "virtual swamps" without adequate clean water, latrines or sanitation (97). In Bangladesh, the area in which flooding and landslides occurred in 2012 was an area naturally prone to flash floods and landslides (103). Of the more than five million people affected, the population most affected were those living on unplanned settlements near the banks of rivers and along hilly mountainsides (103), making health care provision challenging. A similar situation was reported after the 2017 mudslide in Colombia, where the affected zone's geological instability generated problems for the response teams (104). In India (110) and Somalia (107), drought conditions affected the health status of affected populations prior to the earthquake and conflict, respectively.

<u>During emergency</u>

The social, political and economic factors as well as the state of the national health system and the natural environment are all equally important considerations during the emergency. Factors such as the language spoken by affected populations influenced service delivery by international actors. Lane commented that although translators were hired from among the local population in the aftermath of the Sri-Lankan tsunami, this was an aspect that the team had not adequately prepared for prior to the intervention. Translation was said to be the "rate-limiting step in daily operations" (100). Qayum, in providing services at a refugee camp in Pakistan, also acknowledged that language can be a serious barrier in the delivery of health care, and suggested that health personnel should be hired from locals or those who can speak and understand the language of the disaster-affected population (116). The Pakistan Red Crescent Society when delivering PHC services after the floods in Balochistan in 2017, made note of providing culturally-appropriate services, and included male and female medical officers, and male and female health educators and a "lady health visitor" (108) on mobile clinics. In Colombia, the response to the mudslide involved consideration of a specific cultural context as the disaster affected indigenous communities. In this instance, the Colombian Red Cross

Society was required to coordinate with State institutions responsible for this population group and employ a tailored approach in the response (104). Consideration of culture and religion also came into effect where international medical organisations mentioned engaging with community and religious leaders as part of a rapid needs assessment (103) and when negotiating access to affected populations (119).

An important contextual factor affecting service delivery by international humanitarian actors was the **political landscape** in which the emergency occurred. In describing the relief response provided to Ethiopians affected by conflict and drought in the horn of Africa in the early 1990s, Henderson commented that the "effectiveness of assistance to victims of natural and man-made disasters is substantially influenced by the social and political context in which aid is provided" (98). Several articles mentioned the authority of the government breaking down during conflicts – for example, in Somalia, Syria and Nigeria (109, 114, 115, 122, 128, 129). Others discussed that politics and bureaucracy at the national level delayed the relief response and affected the speed with which aid was requested (98, 100, 110) and the type of aid which was requested (98).

Politics also affected the relief response when limits were placed on the freedom of operation of humanitarian actors (98, 106, 122, 123, 126, 128) such as in Ethiopia (98), Syria (106, 122, 128) and Myanmar (123, 126). Government restrictions on humanitarian activities and limitations placed on humanitarian access sometimes forced humanitarian activities to be suspended, leaving populations without access to PHC for considerable periods of time (123, 126, 128). Other political factors which affected service delivery included policies directly targeted at affected populations in the countries of intervention. For example, Sabatinelli describes the differences in access to state social services, including health care, for Palestinian refugees in Lebanon, Jordan and Syria in 2010. Palestinian refugees in Lebanon were ineligible for state social services which meant that this group was largely dependent on services provided by iNGOs (117). Conversely, Palestinian refugees in Jordan could access the country's health services and enjoy "considerable social mobility" (117). In Syria, Palestinian refugees had full access to government services, including health care and hade almost the same legal protection as Syrian citizens (117). This example highlights the need for international actors to understand the different political contexts in which they work and tailor their responses accordingly, as affected populations will have varying limitations placed on health care access and utilisation.

Other contextual factors which affect PHC service delivery by international actors during a disaster, are **disaster-specific**. They include the scale and extent of the disaster, such as the magnitude of an earthquake or the strength of a tsunami, and the level of security in which a man-made disaster such as a conflict occurs.

The **scale, magnitude and extent of a natural or man-made disaster** has an impact on the extent of damage caused to the health system and therefore the magnitude of the response required by international actors. All three of the peer-reviewed articles on natural disasters describe significant natural disasters which occurred over the last two decades. The earthquake in Haiti in 2010 measured 7.0 on the Richter scale (63) and the earthquake in Gujarat state in India in 2001 measured 7.7 (110). The Boxing Day tsunami in 2004, was one of the worst natural disasters to affect the South-East Asian region, killing more than 220, 000 people in 14 countries (130). The authors of these three articles acknowledged the extent of the devastation caused by these significant natural disasters and the corresponding response required from international actors (63, 100, 110).

The parallel of a large-scale natural disaster can be made to the scale of death, injury and displacement that results from a large, wide-spread conflict, such as that in Syria (122, 128) or South Sudan (96). Both these conflicts have resulted in massive unmet needs requiring a significant international response (96, 106, 122, 128). Conflict and the resultant effect on the **level of security** in which international humanitarian actors work was a major consideration for how PHC services were set up in many different settings (96, 101, 102, 105, 106, 109, 114, 115, 118, 121, 122, 127-129, 131). For example, in Somalia, Van Rooyen described clan warriors repeatedly using force to ensure that their members were treated by relief workers on demand (129), necessitating military escorts on mobile medical clinics. Lane also reports that the Sri Lankan army provided support to the US military medical team responding in north-eastern Sri Lanka (100). In South Sudan, MSF clinics were repeatedly attacked, forcing the team to suspend activities (96) and use alternate models of service provision such as running clinics on boats to service isolated villages (96).

In Syria and Yemen, medical facilities supported by MSF were hit by bombs or shells in targeted or indiscriminate attacks (122, 128, 131). This resulted in operations being suspended for periods of time in some instances (101, 114, 115, 122, 123, 126, 128). For example in Syria, parts of the country and 'hot spots' of the conflict were completely inaccessible for periods of time by international actors (106, 122, 128). In these areas, international actors maintained their support of medical facilities remotely (106, 122, 128). Insecurity also limited the action of some humanitarian actors to more stable areas while avoiding insecure areas. For example in parts of Iraq, Lebanon and Ukraine, MSF and the IFRC reported that one of the main challenges was the lack of humanitarian actors in unstable areas, as most were focused on parts of the country which were more stable and secure (105, 119, 127). This renders some areas affected by conflict with comparatively less assistance compared to other parts of the affected country (106, 107, 119, 122, 127, 128).

Even in natural disasters, insecurity affected the ability of humanitarian actors to access affected areas – for example, in Balochistan, the Pakistan Red Crescent Society was one of the few

humanitarian actors with the community outreach and response capacity to operate in the affected areas (108). This was similarly reported in the Colombian mudslide, where affected areas of the natural disaster also experienced armed conflict and violence, making the relief response challenging (104).

Insecurity limited the movement of people and was a reason for iNGOs to resort to mobile clinics for service delivery instead of using fixed health centres, in order to reach affected populations (106, 114, 123, 126, 128). However, in some contexts, insecurity caused people to move continuously – for example in Niger, more than 50% of refugee and returnees were said to have changed their place of settlement at least three times since their arrival in Niger (101). This was also reported in Ukraine where people moved between government controlled areas and non-government controlled areas (105). Insecurity also limited the movement of goods and supplies by military blockages and checkpoints (106, 117, 118, 121, 122, 124, 126), affecting the efficiency and response of international actors.

2.4.4.2 ***System-level factors***

Governance and Leadership

Governance and leadership as evaluated in this review referred to policies in place by each actor/organisation for PHC service delivery. For almost all organisations included in the review, specific PHC policies were not mentioned. However, it was apparent that each organisation seemed to have its own 'policy' or approach to PHC delivery, based on its mandate for operation and capacity for service provision, and according to their own internal structures and processes. For example, large organisations such as MSF and the IFRC seemed to have pre-determined methods of service delivery which were employed across different settings. For MSF, there was no specific mention of policies, however maintaining its mandate as a health service provider during emergencies, there were interventions delivered during acute periods of conflict with plans to handover activities when periods of intense conflict eased or when there was another actor to handover activities (95, 115, 118). For the IFRC, there seemed to be a more structured approach to PHC service delivery with aspects of the PHC response involving activation of the local Red Cross and Red Crescent Societies, training and mobilising local volunteers as community health workers. There was also mention of a policy on Community Based Health & First Aid (101) and mobile health units (108).

The UNRWA has been providing health services for a growing population of Palestinian refugees in Jordan, Lebanon, Syria, West Bank and the Gaza Strip for more than 60 years (117). UNRWA's health programme, as of 2010, had become a "network of 138 primary health care clinics serviced by 3000 health care workers, who deliver comprehensive primary health care services free of charge" (117).

The organisation reportedly has a well-developed and articulated philosophy on preventive medicine (94). On the contrary, other actors, such as foreign medical teams providing short-term relief (63), did not seem to have any specific policies in place.

Adjustment to population health needs

Adjusting to population health needs in the PHC system involves priority setting, surveillance for diseases and learning and innovating (71). Services seemed to be prioritised according to the major needs of the disaster, which varied from disaster to disaster and the local epidemiology of the country. For example, in Syria, immunisation activity was made a priority as a result of the resurgence in polio (106); after the Colombian mudslides, providing first aid and mental health services were made a priority (104); in South Sudan, outbreak preparedness especially for malaria and measles formed a large component of the response (96, 97). Different services were also provided in different parts of the same country by the one organisation, reflecting adaptation to local needs (96, 97, 114, 115).

In general it seemed that in African countries, services were prioritised towards communicable diseases; much of the morbidity reported were malaria, respiratory tract infections and acute watery diarrhoea (96, 107, 109, 118, 121). In Middle-Eastern countries, such as Iraq, Syria and Yemen and in Ukraine, non-communicable diseases seemed to be the priority with the treatment of diabetes, hypertension and mental health conditions featuring in many of the interventions (95, 112, 113, 122, 124, 125, 127, 128, 131). However, common areas of intervention in African and Middle-Eastern countries appeared to be maternal, reproductive and child health care and mental health (95, 97, 107-109, 113, 114, 118, 125, 128).

For the IFRC, priority-setting was also about assessing the level of vulnerability of the disaster-affected population. Several IFRC articles (103-105) mentioned that beneficiary selection was based on the most vulnerable – for example, people older than 65 years, families with three or more children, single-headed families, persons living with disabilities and people with special needs, including chronic diseases (103, 105). There was an increased priority given to those with multi-vulnerability. In other settings, beneficiaries were also prioritised on the vulnerability of living conditions – for example, after the floods and landslide in Bangladesh – those living on hill slopes and river banks were given priority (103). After the Colombia mudslide, priority was given to people housed in official and unofficial collective centres, those who did not receive assistance from the national government and people in hard-to-reach areas due to damaged roads (104).

2.4.4.3 ***Inputs***

Facility Infrastructure

Several articles reported on the destruction of PHC facilities by natural disasters and conflicts (63, 95, 97, 106, 110, 112, 119, 122, 123, 128, 131). Bremer reported that after the earthquake in India, 50 PHC and community health care centres were destroyed, leaving between 700,000 and 900,000 people with complete or partial loss of access to PHC services (110). Broach reports similarly that much of Haiti's health care infrastructure was destroyed after the Haiti earthquake (63). In conflict settings, MSF and the IFRC reported that health facilities were caught up in collateral damage during conflict (95, 106, 112, 119, 122) or were increasingly directly targeted by airstrikes or looting, as occurred in Iraq (112), Syria (122, 128), South Sudan (96, 97), Myanmar (123) and Yemen (131).

As shown in Tables 2.5 and 2.6, international actors used a variety of facility infrastructure to deliver PHC services, including fixed health centres, outpatient departments in hospitals and mobile clinics. As previously explained, in natural disasters, mobile clinics were the predominant method for delivering services. Whereas, in conflict settings, services were predominantly delivered via fixed health centres; although a mix of mobile clinics, fixed health posts and outpatient departments in hospitals were used, as applicable in different contexts.

There was little mention of facility design and layout in the articles. Henderson reported that health centres or health posts were usually simple buildings constructed from local materials (98). They were sometimes pre-existing health centres which were renovated or refurbished (96, 97, 122, 125).

Workforce

The literature conveyed that many health workers in the national health system were killed, wounded or displaced after a disaster (63, 95, 110, 119, 131). Some staff were relocated with relatives soon after a disaster (110, 119, 122) or re-settled in a third country (29). Where national staff were present, they were sometimes not adequately compensated through the usual means (124). For example, in eastern Ukraine, salaries of national health staff had not been paid for months (124). Further, in conflict settings, staff may be attacked, abducted or arrested by armed forces and rebel groups – this was reported in Syria (106, 122, 128), South Sudan (96) and Yemen (131). Where national staff were available and in more protracted crises, they were hired by iNGOs (29, 63, 94, 98, 109, 112, 117). In UNRWA-run facilities, Lilienfield reported that health centre physicians as well as nurses, laboratory technicians, pharmacists, midwives and traditional birth attendants were almost all Palestinian (94). Community health workers were also often hired from the local population to provide health education (29, 98, 101, 102, 108, 109, 112).

Depending on the context and the acuity of the response, international medical staff provided direct clinical care (63, 95, 100, 110, 112, 118, 119, 129, 131). In these circumstances and where reported, there were a range of medical specialties providing PHC services – emergency medicine physicians, family medicine physicians, internal medicine physicians, paediatricians, orthopaedists and nurses (63). International staff were also involved in supervising and training national staff colleagues (29, 98). Despite the usefulness of international staff in these circumstances, Lane commented on the limited time that international medical staff had for training and preparation for humanitarian assistance operations, and the transient nature of international staff responding to emergencies (100). Others also commented that when the acute phase was over and international medical staff had left, health staff were not replaced and/or the remaining staff were over-stretched and exhausted (29, 110).

Drugs & Supplies

The effect of conflict and natural disasters on the drugs & supplies of the national PHC system was mentioned by a few articles. The adaptability required of the humanitarian response is illustrated in the article by Henderson, who noted that standard treatment guidelines were developed to treat the most common illnesses to utilise the limited quantities of available drugs in Somalia (98). Bremer reported that drug stores and distributions systems had collapsed following the earthquake in India (110). This was also reported with the conflict in Yemen (131) and Somalia (107), and a shortage of vaccines and medicines were reported in the conflicts in Syria (106) and Ukraine (120).

International NGOs and UN agencies reported bringing in their own drugs and supplies for service provision (29, 63, 94, 95, 98, 104, 106-108, 112, 118, 121, 122, 129). Henderson explained that in Somalia, most drugs were supplied by UNICEF or UNHCR, supplemented by small quantities from private agencies and national stocks (98). Lilienfield mentioned that the UNRWA pharmacy was well supplied from a formulary developed by the organisation (94). Where services were not directly provided by iNGOs, drugs and supplies were donated to facilities operated by the national system (106, 119, 122, 125, 128).

Although the provision of drugs & supplies were an essential contribution to the international response, Bremer also describes the chaotic situation which occurred in India after the 2001 earthquake. Nearly three weeks after the earthquake, he states that pharmaceuticals had piled up in large quantities in tents without cupboards and without order; advanced hospital drugs and narcotic drugs were inter-mingled with drugs that required refrigeration. Some of the drugs were labelled in a foreign language, some of them were nearly outdated or without relevance to the disaster situation (110). This underscores the need for relevant and appropriate drugs and supplies

to be provided during a disaster with adequate consideration given for storage, supply and management.

2.4.4.4 ***Principles of primary health care service delivery***

Access

The concept of first-contact access to PHC is perhaps the most relevant principle of PHC service delivery in a humanitarian emergency. In the humanitarian emergencies described here, this concept was generally used to mean that populations were able to seek health services *and* that health service providers / international humanitarian actors were able to access a population. This latter idea brings about the concept of humanitarian access, which was mentioned by several articles (95, 96, 106, 114, 115, 117, 118, 122, 126-128). Access to PHC services for affected populations was most severely affected by conflict, insecurity and the resultant impact on health infrastructure and the workforce. Several authors described limitations for populations in accessing health care due to the presence of military installations, checkpoints and blockades which limited movements of affected populations (95, 96, 106, 114, 115, 117, 118, 122, 126-128). Access to populations by service providers was made more difficult by limitations to movement via poor road networks or damaged roads, especially in countries like Central African Republic, South Sudan, Pakistan, Bangladesh, remote parts of Ukraine and Syria (97, 103, 104, 106, 108, 118, 120).

Acknowledging that there are numerous definitions of the term 'access' (132, 133), other aspects of access that were mentioned in the literature were around the availability of services, geographic access, and timeliness. Regarding the availability of services, several articles mentioned that available health care fluctuated constantly as various government and non-government organisations came and went (63, 98, 100, 110, 119, 127). In terms of geographic access, several articles mentioned the difficulty in accessing certain pockets of affected communities due to the geographic remoteness of refugee camps and villages (96-98, 105, 106, 118). Regarding timeliness of the response, a couple of articles mentioned delays in setting up services for the affected population due to bureaucracy and lack of humanitarian access to populations (106, 110).

Comprehensiveness

This review excluded articles explicitly describing vertical health programs. Acknowledging that not all reports systematically described the types of medical services delivered, services were comprehensive in that they aimed to meet all the common needs of the population. As described in the section on 'Adjustment to population health needs', services provided seemed to be in line with the local epidemiology of the affected country and health needs resulting from the disaster.

The focus of services was on the biomedical aspect of health care, with all actors reporting the provision of essential medical care for commonly seen medical conditions (29, 63, 94-98, 100-110, 112-129, 131). Many reported providing services for women and children (94, 97, 98, 102, 107-109, 114, 115), while others spoke specifically about the need for mental health services (104, 105, 114, 131). Community–based disease prevention and health promotion activities were also undertaken by some with community health workers and volunteers conducing health education and information sessions and providing a link to the community (94, 101-103, 105, 107-109, 112, 129). Rehabilitation activities in the form of physiotherapy services were provided in some interventions (112, 117, 122), but there was also mention that services for people with disabilities and rehabilitative services was lacking in some settings (94, 110, 117). Two articles mentioned the provision of services for nutrition (94, 98). No articles mentioned the provision of palliative care services.

Coordination of care

Coordination of patient care across levels of care in this setting mainly applied to the coordination between primary and secondary levels of health care. Several articles reported that efforts were made to coordinate with available secondary healthcare facilities (29, 63, 94, 98, 103, 109, 114, 116-118, 124, 128, 131). In some settings, MSF provided both primary and secondary health care and in these instances, referrals were made within the organisation (95, 97, 112, 115). A few articles reported that there was poor access to secondary healthcare facilities (94, 116, 125, 127, 129). Distance to facilities (125) and the cost of referrals (94, 116, 127) were mentioned as a barrier to accessing secondary care services. Although it was not reported, there is an inference that referrals to secondary care may have been easier in urban areas with pre-existing secondary healthcare facilities (95, 112, 119, 122, 128), compared to areas of intervention in more remote parts of affected countries (96, 97, 115, 123, 126).

Continuity of care

Continuity of care, as it applied to relational continuity between health service provider and patient, was the least considered aspect of PHC service delivery in the setting of humanitarian emergencies. Continuity of care was mentioned by three articles: after the earthquake in Haiti, Broach mentioned that IDP camps were visited on a rotating basis by the same team to provide as much continuity of care as possible (63); Sabatinelli mentioned the need to “react rapidly to ensure continuity of comprehensive PHC in UNRWA health facilities” in response to increasing conflict (117); and Lilienfield commented that in the setting of health centres serving out-of-camp populations, UNRWA’s home visiting program for postnatal surveillance and infant care was not always effective

in guaranteeing continuing care (94). These articles were concerned less about ensuring continuity of care for individual patients, rather about the continuity of care of services provided by the organisation. In this regard, MSF reported to be providing continuous care in several countries of intervention for decades – among others, MSF has been working in South Sudan continuously for more than 30 years (97), in Iraq for 13 years (125), and in Mali for 12 years (121).

2.5 Discussion

In this scoping review, I identified 37 primary reports of interventions conducted at the primary health care level by international humanitarian actors in the acute phase of humanitarian emergencies, published between 1983 and 2018. The findings of this review indicate a paucity of evidence on PHC service delivery by international actors in conflict and natural disaster settings, especially in the published, peer-reviewed literature. I also found that the various international actors involved in the humanitarian response define PHC differently, which affects their approach to service delivery. There are differences in the method in which PHC services are delivered during natural disasters and conflicts, relating to the context of the intervention. Mobile clinics are the predominant way in which PHC services are delivered during a natural disaster and a variety of mobile clinics, fixed health centres and outpatient departments in hospital are used during conflicts. Finally, this review identified that all aspects of the PHC system are affected during humanitarian emergencies, from the context to higher-level 'system' factors to inputs to the health system such as facility infrastructure, workforce and drugs & supplies, which have an impact on how services are delivered by international actors. It also showed that while the key principles of PHC are necessary considerations in these settings, there are challenges in applying these principles in humanitarian emergencies.

Much of the content that was analysed in this review originated from the grey literature. There were only nine peer-reviewed articles describing the PHC response by international actors over a 38-year time period. Although there were a variety of international humanitarian actors represented in the peer-reviewed literature, there were no articles written by several of the major humanitarian iNGOs, such as MSF, the IFRC or IRC, who routinely provide PHC services in humanitarian emergency settings. Despite no limitations being placed on the type of studies included, the peer-reviewed literature did not contain any epidemiological studies of PHC interventions; all were descriptions of interventions. The grey literature also consisted only of reports – mostly updates of crises meant to inform the general public about the organisation's activities, or appeals for funds to continue operations. In these articles, there was no systematic approach to reporting PHC interventions, there was key information missing, and the quality of reporting was variable. Despite these limitations, there are key insights that

can be gained into how PHC services are delivered in humanitarian emergencies by international humanitarian actors

The review drew attention to the lack of consensus on the definition of PHC in humanitarian settings. Primary health care was conceptualised differently by different humanitarian actors. To some, PHC meant the provision of a complete package of medical and public health services, while incorporating multi-sectoral action, and to others, it simply involved the provision of medical care. International actors represented in this review may well define and have policies on PHC provision that are not clearly stated in the type of articles included in this review. However, it was evident from the approach taken to PHC service delivery, that actors delivered services according to their own organisational mandate and capacity. For example, the IFRC have a strong emphasis on community involvement as a part of its mandate, while other iNGOs or foreign medical teams may not necessarily encompass this aspect in their organisation's directive. The capacity of an international actor to intervene in an emergency also seemed to play a role in their overall approach to PHC. For example, MSF is one of the largest, international, medical iNGOs delivering services in humanitarian emergencies, and this was evident from the review. More than half (20/37) of the included articles were from MSF. Their capacity to deliver PHC services will undoubtedly be greater than smaller iNGOs or foreign medical teams, who may not be able to deliver the full gamut of PHC, as the larger organisations.

Even within the same organisation, the extent to which the core aspects of PHC were included in every intervention was different. For example, in some interventions by MSF, there was no mention of multi-sectoral action or involvement of public health functions. This could be due to a lack of reporting, and it could also be because these aspects were covered by other actors – for example, if MSF was providing essential medical services, another actor may have been covering public health functions. While both these factors may be true, it highlights that there is no consistent approach to PHC service delivery within and between international humanitarian organisations. It also raises the possibility that affected populations are left with varying degrees of PHC service coverage and expectations of the 'PHC system' that is formed during a humanitarian emergency. It begs us to consider the question: What is the level of primary health care that should be delivered by international humanitarian organisations in humanitarian emergencies? Is it enough to provide medical services at the community level, or should there be concerted effort to include multi-sectoral action and community empowerment?

Community empowerment in PHC service delivery was an aspect that did not feature in any of the included articles. Perhaps this was because service providers did not think this an important aspect in the acute phase of a humanitarian emergency, or perhaps it was not considered important at all. It is conceivable that international humanitarian actors do not involve communities during the acute phase

of a major emergency where the immediate needs are overwhelming. However, 22 of the 30 conflicts reported here were in settings of protracted crises, some lasting decades. In these protracted crises, there is a requirement to re-think the manner in which emergency response is conducted, because 'acute' does not necessarily mean short duration. As protracted crises become the 'new normal' (1), there is increased understanding that placing populations affected by humanitarian emergencies at the centre of operational decision-making, and building strategies in partnership with them will strengthen their capacity to identify, develop and sustain solutions (134, 135). In a rights- and community-based approach, affected populations not only have the right to participate in making decisions that affect their lives, they also have a right to information and transparency from service providers (134, 136). A key recommendation in an evaluation of the UNHCR's emergency response to the 2004 tsunami in Indonesia and Sri Lanka, was that UNHCR should move from seeking community participation in UNHCR projects, and actively reorient its approach to consider how UNHCR can participate in its beneficiaries' projects (137). This notion speaks to the heart of PHC which is embedded in the principles of social justice, equity and participation. This should be no different in a humanitarian emergency.

The aim of investigating the impact of humanitarian emergencies on the PHC system of affected countries was to determine how this influenced service delivery by international actors. By understanding the extent to which individual components of the health system were affected, we may begin to gain an appreciation of the 'gaps in the system' that international actors fill. This review does not claim to provide an exhaustive or comprehensive systems analysis of the PHC system in affected countries. Rather, it provides some insights into the complexity of the humanitarian response required and the wide range of factors, including those at the health system-level, which need to be examined and factored into the humanitarian response and delivery of services.

An important aspect of the health system that international actors needed to consider was the context within which the emergency occurred. The social, economic and political contexts were different in every country and emergency, and sometimes even within the same country. The level of economic development of a country and its citizens, the languages, cultures and traditions are all important variables that need to be taken into account when designing and implementing services at the PHC level by international actors. The medical literature shows that patient satisfaction, compliance with medical recommendations and better clinical outcomes are achieved when health care providers deliver medical care in the context of the patients' culture, customs language and beliefs (138, 139).

The existing state of the health system and pre-existing levels of poverty, together with the further damage caused by natural disasters and conflicts, has a serious impact on the national health system

of the affected country. Many of the low and middle-income countries included in this review already had poor governance, leadership and accountability mechanisms and health infrastructure, including at the PHC level. Facility infrastructure was destroyed, health workers killed, targeted or displaced, damage caused to drugs and supplies, and supply chains disrupted. An awareness of the degree to which each of these elements are affected during a disaster is essential to enable appropriate service delivery, particularly in undertaking the needs assessment during the early response phase in an emergency. It may also have an impact on the extent to which international actors need to invest in the affected country and the length of their intervention, if the national health system does not recover. This has been the case for organisations such as MSF, who have been operating in countries such as South Sudan, Nigeria and Iraq for decades (96, 115, 125).

Contextual factors surrounding an emergency also influenced the method of service delivery during the emergency. The scale and extent of the disaster, the geography of the affected area, and the level of security of the affected area were all factors which likely impacted on the choice of intervention. In natural disasters, services were delivered predominantly via mobile clinics and in conflicts they were delivered using a combination of mobile clinics, fixed health posts and outpatient departments in hospitals. The context in which these disasters occurred may have led to this choice. For example, after the earthquake in Haiti, due to the scale of destruction caused by the earthquake and the displacement of hundreds of thousands of people, mobile clinics were used in the immediate aftermath to deliver services (63). In more stable contexts, such as in refugee camp settings – or non-camp settings in protracted crises, the choice was to deliver health services in fixed health centres – for example as done by UNRWA for Palestinian refugees for decades (94, 117). The effectiveness of these methods of delivery and the level of service coverage achieved, was not stated in the included articles.

In this review, the key PHC principles of first-contact access, comprehensiveness, continuity of care and coordination of care were rarely considered as important aspects of service delivery. The principle which was most considered and applied was that of first-contact access. This concept has been traditionally used to describe the use of services by a population at the PHC-level when a need for them is first perceived (92). In the setting of humanitarian emergencies, where the needs are immense, first-contact access is paramount. However, another equally important concept in this setting is that of humanitarian access, which comprises not only the populations' ability to access assistance or services, but also the humanitarian actors' ability to reach populations in need (140, 141). This concept of humanitarian access was described in several included articles – particularly in the countries of Syria and Myanmar, where aid is becoming increasingly politicised (142, 143) and international actors are denied access to affected populations.

The review found that services were comprehensive in as much as the common needs of the population were met with the provision of a range of services. This was determined to some degree by the local epidemiology of the disaster-affected country and the immediate health needs. Even though this review excluded vertical disease programs, services were prioritised towards common diseases encountered - communicable vs non-communicable, and prioritised by population group – for example, women and children. It was not clear, however, the extent to which services would be maintained and/or expanded to include a wide range of preventive, promotive, curative and rehabilitative services. Rehabilitative services and care for persons with disabilities in particular are important aspects that need to be addressed at the PHC-level, as they remain one of the most vulnerable and socially excluded groups in displaced communities (144). The provision of palliative care services was not mentioned in any of the articles, and there is a current, growing call to include palliative care as an integral component of the relief response (145).

Relational continuity-of-care was grossly overlooked by service providers included in this review. In this setting of mobile, displaced populations with multiple service providers available in some parts of an affected country and scanty access to services in others, this concept is a challenging one to address. However, with increasingly protracted crises, the absence of a functional government, and a shifting epidemiology from communicable to non-communicable diseases in many low and middle-income countries, providing continuous care will be an increasingly important area for international actors to tackle. It is particularly crucial for individuals with chronic diseases who require ongoing follow-up of their medical conditions at the PHC-level. It also becomes important in the context of service delivery via mobile clinics and/or service provision by organisations or medical teams who intervene for short periods of time who need to ensure that populations accessing their care are able to receive ongoing services for their health needs.

It was difficult to ascertain the extent to which coordination of care between the primary and secondary levels of care affected individuals. Articles included in the review indicated that referral to secondary care was possible in some settings and difficult in others. Distance to facilities and the cost of referrals were mentioned as barriers to accessing secondary care in some settings.

There are important limitations to this review which need to be addressed in light of these findings. I only considered humanitarian emergencies resulting from conflicts and natural disasters, thereby excluding information on PHC service delivery in humanitarian emergencies due to other causes. This review also excluded vertical disease programs delivered at the community / PHC level, which omits a relevant form of PHC service delivery. Services delivered via this approach may have important and interesting differences to those described in the more comprehensive approach discussed here. I also did not assess all the elements of the PHC system – focusing only some of the 'System', 'Input' and

'Service Delivery' domains of the PHCPI conceptual framework. It would be useful to understand how other components of the PHC system such as health financing and information systems are affected during humanitarian emergencies.

Although a formal critical appraisal of the literature was not undertaken, the strength of the evidence of the articles included in this review was generally weak. The majority of included articles originated from the grey literature, and most were descriptions of interventions. This kind of evidence is generally considered to lack scientific rigour in its conduct and reporting (146). This was apparent from the reviewed articles - many articles had limited and basic detail of the information required for the review, there was incomplete reporting and the reports often lacked objectivity. Nevertheless, the grey literature provides a valuable source of shared knowledge in the study of humanitarian health, particularly when they are from credible sources (147). In the peer-reviewed literature, there may be publication bias towards those major, large-scale disasters, such as the Haiti and India earthquakes and the Arab/Israel conflict, which may make the results less generalisable to smaller-scale natural disasters and conflicts. In reporting the results of this review, there may be a reporting bias given to those articles (from the peer-reviewed and grey literature) which included more detail than others, over-representing the contribution of these articles to the integrated review.

The delivery of PHC services by international actors in humanitarian emergencies is fraught with challenges. This review highlighted some of those challenges – the lack of clarity on the definition and approach to PHC, the impact of humanitarian emergencies on the PHC system of affected countries corresponding to the level of contribution required from international actors, and finally the need to incorporate key principles of PHC service delivery into service design and implementation. Above all, this review highlighted that there is no 'one-size-fits-all' approach to PHC service delivery in humanitarian emergencies. Approaches to service delivery require a thorough understanding of the context in which the emergency occurs, an understanding of the system within which it occurs and importantly, involvement of the people for whom the disaster impacts.

Chapter 3 Methodological Overview

3.1 Preamble

In this chapter, I present an overview of the methods used in my case studies presented in Chapters 4, 6 and 7. The overall methodological approach is that of multimethods research, where numerous methods are used to explore a particular research topic. I first describe multimethods research and outline the strengths and limitations of this as a methodological approach. Then, I explain in further detail the specific methods that I have used to answer the research questions in this thesis.

In brief, in Chapter 4, I use numerous qualitative methods and particularly realist inquiry to explore the concept of '*context*' in a case study on maternal health care in northern Nigeria. In Chapter 6, I use geospatial analysis techniques to explore the concepts of '*geographic accessibility*' and '*availability*' of PHC services in a case study featuring Syrian refugees in Lebanon. Finally, in Chapter 7, I use quantitative epidemiological analysis to explore the concept of '*continuity of care*' for a group of Syrian refugees with chronic diseases presenting for care at four MSF primary health care clinics in Lebanon. The details of the populations under study, the data collection tools used and methods of data analysis are well-described in the 'Methods' section of the respective chapters, therefore these aspects are not further discussed here.

3.2 Multimethods research

Each of the following chapters uses different methods to examine different elements of the primary health care system in a humanitarian emergency. The notion of mixing methods is not new and has a long history linked to social science research (72). Multimethods research has similarities to mixed methods research, however scholars argue that there are important differences (148, 149).

Brewer and Hunter define multimethods research as the "practice of employing two or more different methods or styles of research within the same study or research program rather than confining the research to the use of a single method" (72, page 12). Unlike mixed methods research, it is not restricted to combining qualitative and quantitative methods, rather it is open to the full variety of possible methodological combinations (72). Multimethods research fits well with pragmatism, where the question of most concern is, "What is needed to answer the research question?," as opposed to a researcher taking a particular epistemological stance on the research approach (150).

Multimethods research provides the flexibility to tackle complex analytical and interpretive issues that arise with diverse ways of thinking and different types of data (150). It often involves traversing disciplines as researchers 'cross borders' to work outside their theoretical comfort zone. Multimethods research is considered particularly useful in seeking answers to multifaceted questions, allowing the researcher to gain a more "panoramic view of their research landscape, viewing phenomena from different viewpoints and through diverse research lenses to get a clearer picture of the social world they are studying" (151, page 1). This type of methodology can be particularly useful in health services research which often involve complex, multifaceted, social interventions (152). Brewer and Hunter also suggest that "solutions based upon multimethod findings are likely to be better solutions – that is, to have a firmer empirical base and greater theoretical scope because they are grounded in different ways of observing social reality" (72, page 15).

While there are clear benefits of adopting this approach, multimethods research presents some challenges. One of these challenges is that the paradigmatic perspectives used in different studies within a program of research may be at odds with each other (72). Therefore, it is necessary to understand the ontological and epistemological viewpoints of different methodologies in order to draw meaningful conclusions on an area of research (72, 150). Working at the border of disciplines also holds key challenges, as researchers need to ask themselves if they have the expertise, analytical interpretive skills and critical inquiry to ensure that they are not borrowing concepts and ideas uncritically from different disciplines (150).

Another aspect of multimethods research that is crucial in the analysis and interpretation phase of a research study is reflexivity, or an awareness of a researcher's own standpoint or methodological positioning (150, 153). Giddings and Grant note that without this kind of awareness, methods may be included in a superficial way (153).

Although multimethods research has presented some challenges, this approach has allowed me to explore the topic of primary health care service delivery in humanitarian emergencies by international actors using a wide array of methodological tools. The ability to analyse and integrate different types of data has allowed me to gain invaluable insights and enriched understanding into this complex and multifaceted topic.

3.3 Specific methods used

The specific methods used in my fieldwork are described and explained below in brief. Their exact application to my fieldwork is expanded upon in each of the subsequent chapters.

3.3.1 Qualitative research methods

In Chapter 4, I used several different qualitative methods to understand the contextual factors underlying an MSF maternal health care project in Jahun, in northern Nigeria. The goal of qualitative methods is to arrive at an understanding of a particular phenomenon from the perspective of those experiencing it (154). In qualitative methodology, the researcher looks at settings and people holistically, and is interested in understanding how people think and act in their everyday lives (154). This phenomenological approach was necessary to dissect and fully comprehend the MSF program in Jahun, particularly to understand the project through the various perspectives of key stakeholders.

The specific qualitative methods I employed in this chapter were focused ethnography, content analysis, thematic analysis and realist inquiry, as described below and presented in Chapter 4.

3.3.1.1 ***Focused ethnography***

Focused ethnography is a method in qualitative research typified by short-term field visits where the researcher plays an observer or participant role in the field and has some level of background knowledge to answer the research question at hand (65). The questions in focused ethnography relate to describing experiences within cultural contexts of specific groups or sub-groups (66). Wall suggests that focused ethnography is especially relevant when conducting applied social research in highly fragmented and specialised fields of study (67). Interviews, participant observation, field notes and document analysis are regarded as classic features of focused ethnography (65, 66).

3.3.1.2 ***Realist inquiry***

Realist inquiry is based on the premise that 'aspects of context trigger particular mechanisms in response to an intervention, which result in observable outcomes' (71). Programs are said to be shaped by a vision of change by their designers and their success or failure depends on the accuracy of that vision (72). The fundamental question asked by realist researchers is: 'What works for whom in what circumstances, in what respects, and how?' (73). There is an acknowledgement that interventions never work indefinitely, in the same way and in all circumstances, or for all people (71).

3.3.1.3 ***Theory of Change***

Similar to realist inquiry, the theory of change (ToC) is also a form of theory-driven methodology (155). The aim is to derive a program's theory by describing how it intends to achieve its primary objective. This is done by articulating key underlying assumptions and demonstrating intended and unintended links between its inputs, outputs and outcomes (155). It is a theory of how and why an initiative works (156). A ToC approach is generally used to build consensus among stakeholders to agree on the inputs and processes required to achieve a program objective (155). The ToC framework that I developed was distinct in that it was not developed in collaboration with stakeholders, but rather from the results of the realist inquiry, the content analysis of stakeholder interviews and review of key documents.

3.3.1.4 ***Content analysis***

Content analysis is closed linked to thematic analysis and is also another commonly used method in qualitative research analysis. Berelson first described content analysis as a research technique for the "objective, systematic and quantitative description of the manifest content of communication" (70, page 15). Although originally used in analysing documentary evidence, content analysis is now used to analyse other forms of data such as interview data and observational field notes (69). A central tenet of content analysis is that the many words in written text or spoken word can be classified into far fewer content categories (157). Words, phrases or other units of text classified in the same category are presumed to have similar meanings. Valid inferences from the text must be consistent to ensure reliability (157).

3.3.1.5 ***Thematic analysis***

Thematic analysis is the most commonly used descriptive qualitative method for analysing qualitative data (68, 69). Thematic analysis is closed linked to content analysis, with the aim being to identify patterns ("themes") across qualitative datasets (158). The focus of thematic analysis is on identifying and describing both implicit and explicit ideas within the data, thereby generating themes (159). Themes, according to Braun and Clarke, are a "pattern of shared meaning, organised around a core concept or idea" (158), requiring involvement and interpretation by the researcher. Thematic analysis is particularly useful to capture complexities on meaning within a textual data set. (159).

3.3.2 Geospatial analysis

In Chapter 5, I used geospatial analysis methods to explore the concept of geographical accessibility and availability of primary health care clinics (PHCCs) for Syrian refugees with chronic diseases

presenting for care at four MSF clinics in the Bekaa valley in Lebanon. Spatial methods were used to visualise the distribution of available PHCCs and network analysis was used to estimate the distance travelled to an MSF clinic to examine whether travel distance to a clinic affected the frequency with which certain groups of people presented to a particular clinic. Adapting this method to a humanitarian health setting provided unique insights into the concept of access, particularly related to humanitarian access.

Geospatial analysis is the analysis of location information (160). It has historical roots in print cartography but is increasingly being used in health services research (161). Geospatial analysis attempts to answer the question 'What happens where?' (160). Recent developments in geographical information systems, improved availability of spatial data and advancements in spatial analysis techniques have been attributed to an increased role for geographical information to connect the individual to their environment (160, 162). The increasing application of spatial analysis techniques to health services research has arisen from a growing acknowledgment that individual health is affected by the environment, while the environment is also continuously reshaped through various human activities (163). This spatial perspective of health facilitates the examination of local dynamics between populations and their environment, and helps researchers understand the wider environmental determinants of health (162, 164).

The application of geospatial methods require the use of atypical data types (160). At its foundation, most geospatial applications require some kind of map; other data types include shapefiles, points and map projections (160). There are potentially many layers of detail to process and visualise, including the use of specialised algorithms (161). It is perhaps due to this complexity of analysis that geospatial techniques have not yet been fully adapted into humanitarian health research. The main barriers identified with the application of geospatial technology in humanitarian response relates to issues with data collection, data management and data sharing, not from any major deficiency in the technology itself (165). Field data collected in the fast-paced setting of a humanitarian response effort is deemed to be inconsistently reported, unstructured, and lacking basic spatial reference information (165).

These reported challenges were all present while planning the research study presented in Chapter 6. However, they were managed by collaborating with field partners to share data and by using the expertise of colleagues with geospatial analysis skills.

This methodology has the potential to answer questions that could not be answered previously. It could assist humanitarian practitioners in uncovering the most effective ways to deliver health care to the most vulnerable populations.

3.3.3 Descriptive epidemiology

In Chapter 6, I used descriptive epidemiological methods to describe the characteristics of a group of patients with chronic diseases presenting for care at four MSF clinics across the Bekaa valley in Lebanon. This was done on a dataset of routinely collected MSF patient information. In addition, I used univariable and multivariable logistic regression modelling to examine individual-level characteristics of patients who remained in care for six months or longer.

Epidemiology is the study of the occurrence and distribution of diseases and other health-related conditions in populations (166). Epidemiological studies can be classified into descriptive and analytical. Porta's dictionary of epidemiology defines descriptive epidemiology as: "epidemiological studies and activities with descriptive components that are much stronger than their analytic components" (167).

I used descriptive epidemiology in this study of Syrian refugees with chronic diseases, because descriptive epidemiology is particularly useful when little is known of the epidemiology of a disease. It is also useful for determining the prevalence of conditions in a population (166). Descriptive epidemiological studies describe populations by person, place and time and often involve general descriptions concerning the relationship of disease to basic characteristics such as age, gender, ethnicity, occupation, social class and geographic location (167). This information can be used to set priorities for investigation and control, and in deciding where preventive efforts should be focused (166, 168).

Descriptive epidemiology can be performed using multiple data sources (166). Usually, but not always, routinely collected data is used to provide a rough indication of the frequency or occurrence of diseases and of their association with person, place and time (168). The descriptive statistics generated can be used together with clinical observations, laboratory studies and other sources of information to generate hypotheses (168). These hypotheses can then be tested and further refined using analytical studies.

Descriptive studies are positioned at the base of the hierarchy of scientific evidence (167). However, their importance as the basic roots of the epidemiologic approach has not changed. In particular, disease prevalence and incidence data perform an essential role in both research and clinical settings (169). High-quality descriptive studies can provide fruitful scientific evidence and have societal relevance (170). Basic descriptions of the relationships between disease occurrence and the characteristics of person, place, and time remain the fundamental building blocks of epidemiology.

Analytic epidemiology is used to quantify the association between an exposure and outcome to test hypothesis about causal relationships (168). Logistic regression is a modelling technique used in analytic epidemiological studies to fit data to a particular statistical equation (169). In regression models, the outcome is a function of exposure variables, confounders and interaction terms (169). The aim of logistic regression is to determine the predictors that are most significantly related to a binary outcome (169).

3.4 Summary

The diversity of methods used in this thesis reflect the nature of this multi-dimensional research topic. There are considerations of disparities among populations, age groups, ethnicities, and cultures, behavioural factors contributing to program fidelity, perspectives of users of the system, and translational needs for further research. The diversity also signals a growing acceptance of social science research and the use of multimethod approaches to investigate complex health topics, such as that of health service delivery in humanitarian emergencies.

Chapter 4 Contextual analysis of a MSF maternal health care project in northern Nigeria

4.1 Preamble

The concept of context is implicit to any health system. The wider political, cultural, demographic, socioeconomic and other such contextual factors are known to play an important role in the health of individuals and to the health system as a whole (171). This is no different in a humanitarian setting. International humanitarian health actors work in multiple countries and in different parts of the same country to provide health services to populations in crisis. As identified in the scoping review, each area of intervention has unique contextual factors which international actors have to adapt to and understand in order to provide relevant and effective medical care.

The emphasis of this chapter is on the concept of 'context' and the implications for health service provision by international actors such as MSF. This concept is analysed during a four-week field visit made to a MSF maternal health care project in Jahun, a town in the northern state of Jigawa, Nigeria, in April to May 2017. The focus of this maternal health care project was on a secondary-level health care facility to reduce maternal and neonatal morbidity and mortality. In analysing the contextual factors of this project, I aim to demonstrate the importance of PHC as a crucial element of the continuum of care for a woman during her pregnancy, necessary to achieve gains in maternal and neonatal outcomes. Findings from this study were used to develop the conceptual framework described in Chapter 8. Before delving into the research study itself, I provide some background below on my role in this project and how the idea of analysing *context* came about.

4.1.1 My role

The field visit to Jahun and its role in my PhD research originally came about as a result of a study conducted by Epicentre, one of MSF's operational research centres, in 2016. This study was conducted among 825 women presenting to MSF's secondary healthcare facility in Jahun between 14 April and 22 May 2016. The study found that having attended at least one antenatal care visit during a woman's pregnancy was protective against developing a major direct obstetric complication MDOC (172). As a result of the study, MSF program managers wanted to undertake further research in Jahun to investigate the best method of providing antenatal care to this population in rural, northern Nigeria. At this stage in February 2017, I was tasked with performing a feasibility assessment on how this research study could be conducted in Jahun.

I visited the MSF project in Jahun between April and May 2017. Over the course of four weeks, it became increasingly clear to me that while access to quality antenatal health services was absolutely essential for women in the area, adding a component of research to the project at that time was not the right thing to do. What I observed in Jahun were overworked staff (some on the brink of exhaustion), an overcrowded, disorganised hospital resulting in compromised patient care and a lack of strategy on how to achieve the program's stated objectives. In addition, upon considering some of the key indicators of the project and the volume of activity and expansion of services, I found it alarming and intriguing that the overall impact of the project on maternal and neonatal mortality rates had not changed over nine years. Hospital maternal and neonatal mortality rates remained considerably elevated at 1 – 1.5% and 17 – 20% per year, respectively, and had remained largely unchanged since MSF's intervention began in 2008. The Jahun project is managed by the French operational centre of MSF. In comparing the health indicators of the Jahun project to other projects managed by this operational centre, the Jahun secondary healthcare facility had the highest percentage of complicated hospital admissions in 2018, the highest rate of stillbirths, and was one of two facilities in which the maternal mortality rate was above 1%, of 21 projects across 15 countries in 2018 (173).

Therefore, instead of focusing on the original aim of the field visit, I used the opportunity to better understand the Jahun project and consider the circumstances and context which contributed to the project being in its current state. I specifically considered the role of PHC in this project and how it may address maternal and neonatal morbidity and mortality reduction. The intention was for this contextual analysis to contribute to improved patient outcomes.

4.2 Introduction

Nigeria is one of two countries in the world that accounted for over one-third of all global maternal deaths in 2015 (174). Although the maternal mortality ratio (MMR) in Nigeria has had a downward trend over the past two decades, it remains one of the highest in the world at 814 per 100,000 live births in 2015 (174), well above the overall ratio for Sub-Saharan Africa of 546 per 100,000 live births in the same year (174). The picture is even worse in northern parts of the country, where the MMR is estimated to range from 1,000 to 1,500 per 100,000 live births compared to 300 per 100,000 live births in southern states (175).

Since 2009, the northern states of Nigeria have also been afflicted by insecurity and unrest due to terrorist activity (176). This has resulted in the displacement of close to two million Nigerians in the

north-eastern zones of the country (177). Development agencies have shut down or scaled back operations in the north due to this insecurity and there are fears that health gains made over the last decade may have attenuated (178).

The northern states of Nigeria comprise a society with relatively conservative Islamic practices. For example, Sharia'a law is practiced in Jahun, a town in northwestern Nigeria. These regions also have the highest number of girl children who are not enrolled in school and those who drop out to get married (179, 180). In northern Nigeria, 68-74% of women have no formal education at all (including primary school), compared to 6-12% in the southern regions (181). The tradition of early marriage persists and the median age of marriage is 16 years in the northern states compared to the national median of 20 years (181). Women also begin child-bearing much earlier: between 40 and 44% of teenagers aged 15-19 have begun childbearing in the north, compared to 22% of women in the same age group nationwide (181).

These regional differences are also apparent in service delivery and uptake of reproductive, maternal, newborn and child health (RMNCH) interventions. In a WHO report on the state of inequality in RMNCH activities in low and middle income countries, Nigeria and Ethiopia had the highest within-country relative inequality, with coverage of eight RMNCH interventions in urban areas exceeding that of rural areas by a factor of two (182). Another study conducted in Nigeria in 2013 on 11 high priority maternal and child health interventions, found dramatically varied coverage rates within the country. States in the northwest had some of the country's lowest levels of overall intervention coverage in 2013, ranging from 21% to 39%, compared to southern states which averaged or exceeded 60% (183). This was also highlighted in the demographic and health survey of Nigeria in 2018, which indicated that 84% of births in southeast states were assisted by a skilled health provider compared to 19% in the northwest (184). Similar trends were seen with respect to women attending the recommended four antenatal care (ANC) visits during a pregnancy. Forty-two percent of women in the northwest had attended four or more ANC visits during their pregnancy compared to 83% in the southeast and southwest (184).

Most maternal deaths in Nigeria are due to emergency obstetric complications including obstetric haemorrhage, pre-eclampsia and eclampsia, sepsis and prolonged or obstructed labour (185-187). Prolonged, obstructed labour is also the most common cause of vesicovaginal fistula (VVF) in Nigeria. A VVF is a direct communication between the bladder and vagina caused by the destruction of maternal pelvic tissue from prolonged pressure exerted by the foetal skull during prolonged, obstructed labour (188). Fistulae, once formed, are treatable only by surgical intervention (189).

The above-mentioned life-threatening conditions are treatable and fistulae are preventable, if women recognise their medical condition, seek health care on time, and receive appropriate care at healthcare facilities (190). Healthcare facilities providing emergency obstetric care (EmOC) have been recognised as a critical component of any program to reduce maternal mortality (191). These facilities exist at the PHC level, and are called basic emergency obstetric and neonatal care (BEmONC) facilities and at the secondary health care level, as comprehensive emergency obstetric and neonatal care (CEmONC) facilities. Their distinction is also defined by the level of obstetric care that is provided. A BEmONC facility is one which can administer parenteral antibiotics, uterotonic and anti-eclamptic medications, manually remove a placenta, remove retained products of conception, perform assisted vaginal delivery and perform basic neonatal resuscitation (192). A CEmONC facility, in addition to the aforementioned services, also allows for the provision of surgery (such as caesarean sections) and blood transfusions (192).

Access to EmOC facilities forms only part of a package of services necessary for the health of women and newborn babies. Services are required throughout the lifecycle of these population groups, and numerous service delivery packages have been described (193-195). In a review of more than 190 interventions of common service delivery strategies, eight distinct packages were recognised to have the potential for significantly reducing maternal and neonatal mortality (Figure 4.1) (196). These included packages for family and community care, four outpatient and outreach packages (reproductive health care, antenatal care, postnatal care and child health) and three clinical care packages (reproductive health care, childbirth care, and care of sick babies and children) (196). Many of the services described in these packages are able to be provided at the PHC level.

In view of the extremely poor pregnancy-related outcomes for women in northern Nigeria, MSF opened a maternal health care project in the north-western zone of Nigeria, in the town of Jahun in Jigawa state, in 2008. Jahun is in a relatively remote part of the country with a contained, non-mobile population. The state of Jigawa is estimated to have a MMR of 1000 per 100, 000 live births (197). The MSF intervention in Jahun, supported and facilitated by the state Ministry of Health (MoH), involved establishing a CEmONC facility within an existing MoH structure, the Jahun General Hospital (JGH). The catchment population of JGH is approximately 461, 000 people including residents from two local government areas (LGAs) –the Jahun LGA with 295, 000 residents and Miga LGA with 166,000.

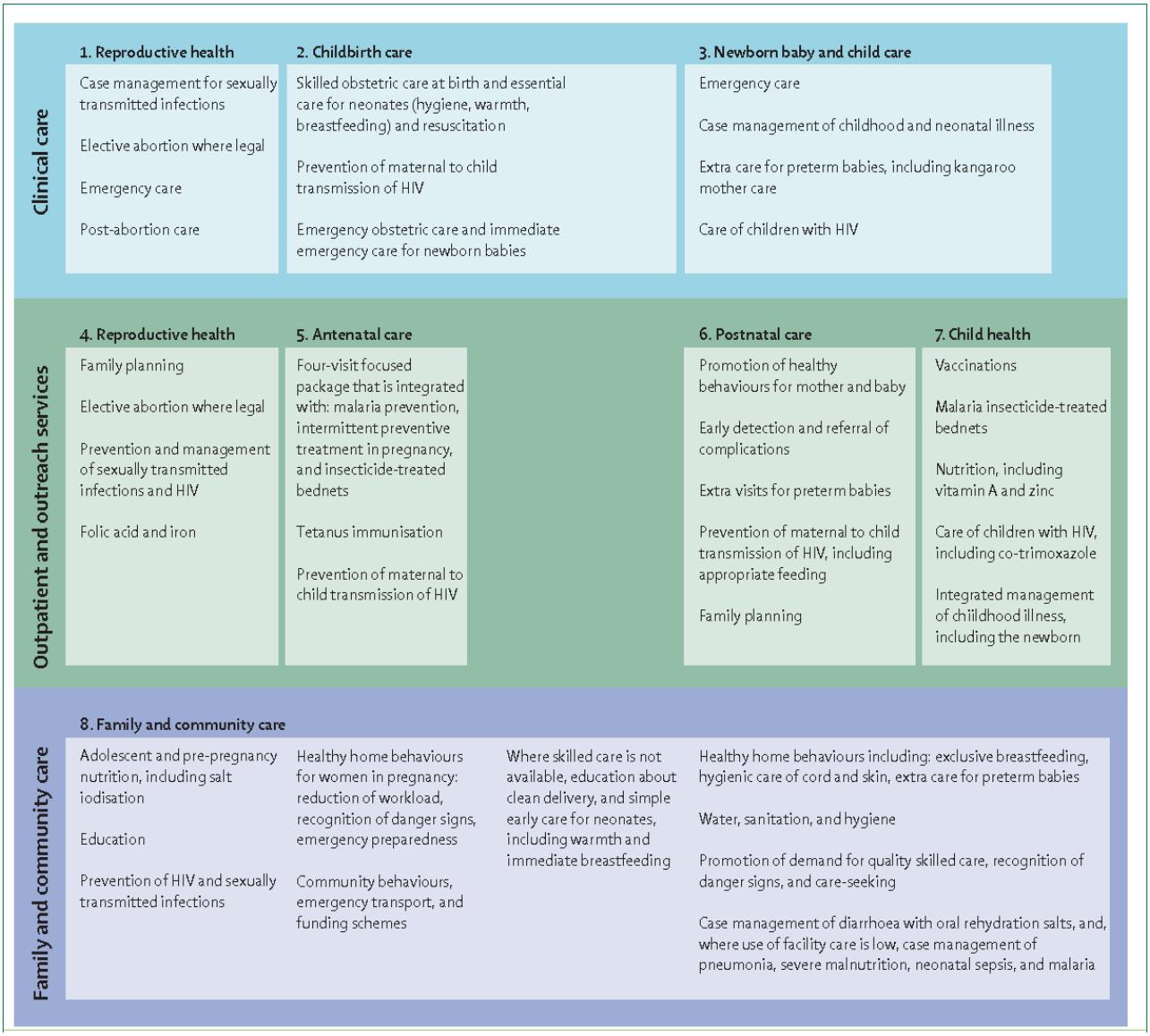
The objectives of the MSF intervention were three-fold. Firstly, it was to reduce the maternal and neonatal morality rates in Jahun and Miga LGAs through the provision of a CEmONC facility. Secondly, it was to manage cases of VVF in Jigawa State and finally, to reduce the incidence of VVF in

the catchment population. According to the original project report, the initial plan was to run a fixed-term project with a focus on these three areas of intervention to enhance MSF's focus on reproductive health services while supporting the Nigerian country strategy at the time (198). It was also an opportunity to improve MSF's competency in VVF surgery (199).

Between 2008 and 2016, the MSF CEmONC grew steadily with an annual increase in maternal admissions of between 14 and 24% (199). As of 2018, the hospital conducted almost 7000 deliveries per year with more than 1000 caesarean sections (200). The medical acuity of presenting patients is high, with 63.5% of women presenting with at least one direct obstetric complication (172). The hospital maternal mortality ratio is approximately 1% and neonatal mortality between 20 and 25% (199). The bed occupancy rate often exceeds 100% with some women having to share hospital beds (200). The incidence of VVF at the hospital has remained unchanged over eight years (199). Despite the initial needs assessment in 2008 documenting that a comprehensive approach (including outreach services, antenatal care and hospital services) was needed to address maternal health care in Jahun, it was not until 2014 that the project strategy was revised to move outside the provision of secondary health care and into primary health care (201). In 2016, two BEmONCs in Miga LGA and Jahun LGA were opened in an attempt to "identify and prevent complications of pregnancy, promote the delivery of uncomplicated pregnancies outside the hospital and to assist in reducing the patient load at the MSF CEmONC" (199, page 10).

The aims of this chapter are two-fold. Firstly, my aim was to understand and explore the contextual factors surrounding this maternal health care project, which had such limited impact on overall maternal and neonatal mortality rates. Secondly, using this understanding of context, I aimed to develop a theory of change framework incorporating the multiple levels at which services are delivered, including at the primary health care level.

Figure 4.1: Integrated packages for health of mothers, newborn babies and children, with evidence-based interventions along the continuum of care, according to place of service delivery



Adapted from Kerber et al., Lancet. 2007; 370 (9595):1358 – 1369

4.3 Methods

For this study, I used a mixture of qualitative research methods including focused ethnography, thematic analysis of key MSF project documents and theory-based methods such as realist inquiry and theory of change. These methods were outlined in Chapter 3 and are presented again here, along with their application to this study.

4.3.1 Focused ethnography

Focused ethnography is a methodology in qualitative research which is typified by short-term field visits where the researcher can play an observer or participant role in the field, and has some level

of background knowledge to answer the research question at hand (202). The questions in focused ethnography relate to describing experiences within cultural contexts of specific groups or sub-groups (203). Wall suggests that focused ethnography is especially relevant when conducting applied social research in highly fragmented and specialised fields of study (204). Interviews, participant observation, field notes and document analysis are regarded as classic features of focused ethnography (202, 203).

The application of focused ethnography to this study is based on a four-week field visit I made to Jahun in northern Nigeria between April and May 2017. As part of this visit, I made personal observations and took notes. I conducted formal and informal interviews, and had participant observation conversations with a wide range of stakeholders in the project, both within and outside of MSF. Within MSF, I spoke with key staff members at the project level in Jahun, with project management staff in Nigeria's capital of Abuja and with MSF headquarters staff in France and Australia. In addition, I participated in MSF activities inside and outside of the hospital. These included ward rounds in the CEmONC, visits to the BEmONCs in primary health care clinics and community visits with midwives and community health workers. Access to hospital medical records, with permission from program staff, allowed me to conduct rapid clinical audits to obtain relevant clinical information. During these numerous activities, I had the opportunity to interact with patients, their relatives and members of the community. I was also able to meet with staff of the Nigerian Ministry of Health in Jigawa's state capital of Dutse.

Discussions with these various stakeholders were structured around the aim of gaining insights into the project and understanding the project through their various lenses. I kept hand-written notes of interviews, but these were not further transcribed.

4.3.2 Content and thematic analysis

Content and thematic analyses are two of the most commonly used descriptive qualitative approaches to analyzing qualitative data (205, 206). Berelson first described content analysis as "a research technique for the objective, systematic and quantitative description of the manifest content of communication" (207, page 15). Although originally used for analysing documentary evidence, content analysis is now used to analyse other forms of data such as interview-data and observational field notes (206). Thematic analysis is closed linked to content analysis, with the aim being to identify patterns ("themes") across qualitative datasets (158). Themes, according to Braun and Clarke, are a "pattern of shared meaning, organised around a core concept or idea" (158).

I used content and thematic analysis to analyse key MSF project documents between 2008 and 2017. Project documents analysed included routine project situation reports, strategy documents,

annual planning documents, end of mission reports from departing staff and internal research studies conducted on the project. In reviewing these documents, my primary aims were to understand challenges faced by field teams over the course of the project's history, to explore reasons for trends in key indicators such as maternal and neonatal mortality and to uncover additional contextual factors operating within the project. I also used thematic analysis to identify recurrent themes emerging from my interviews with the various stakeholders described previously.

4.3.3 Realist inquiry

Realist inquiry is based on the premise that "aspects of context trigger particular mechanisms in response to an intervention, which result in observable outcomes" (208). Programs are said to be shaped by a vision of change by their designers and their success or failure depends on the accuracy of that vision (209). The fundamental question asked by realist researchers is: 'What works for whom in what circumstances, in what respects, and how?' (210). There is an acknowledgement that interventions never work indefinitely, in the same way and in all circumstances, or for all people (208).

Realist inquiry stresses four key linked concepts for explaining and understanding programs: 'mechanism', 'context', 'outcome' and 'context-mechanism-outcome configurations (CMOCs)' (210). Mechanisms (M) explain the logic of an intervention and describe what it is about programs and interventions that bring about any effects (208). Context (C) describes the features of the conditions in which programs are introduced that are relevant to the operation of program mechanisms (208). It is used to address the issues of 'for whom' and 'in what circumstances' a program will work. Finally, outcomes (O) comprise the intended and unintended consequences of programs, resulting from the activation of different mechanisms in different contexts (208, 209). The CMO pattern can be represented formulaically as the equation: C + M = O. In other words, the action of a particular mechanism in a particular context will generate a particular outcome pattern.

It is generally considered that there are no concrete steps for a realist researcher to follow (209, 211). Two eminent realist researchers, Pawson and Tilley, suggest that what is involved is "bringing the imagination to bear" on how a program works through a myriad of qualitative and quantitative methods (208).

The 'context' factors that are presented in the CMOCs in the results section have been derived from my personal observations, thematic analysis from key documents and from relevant literature pertaining to maternal health care delivery in northern Nigeria.

4.3.4 Theory of change

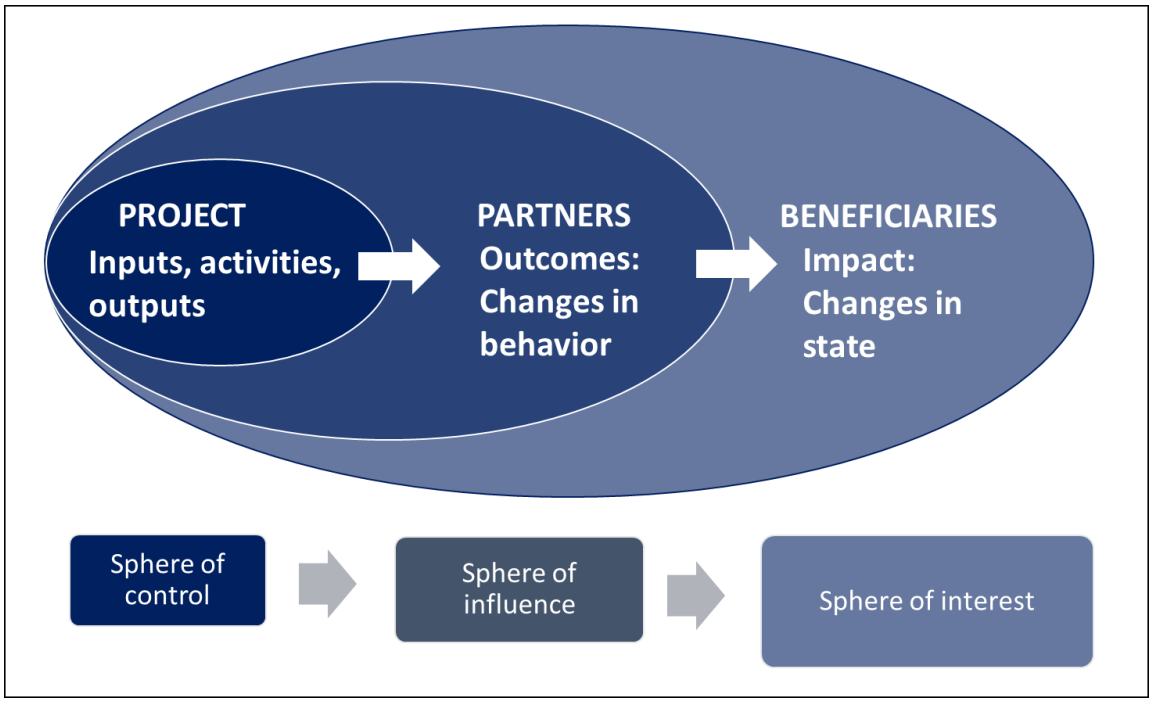
From the results of the realist inquiry, the content analysis of stakeholder interviews and the document review, I developed a theory of change (ToC) framework for the MSF Jahun project. Similar to realist inquiry, the theory of change is also a form of theory-driven methodology (155). The aim is to derive a program's theory by describing how it intends to achieve its primary objective. This is done by articulating key underlying assumptions and demonstrating intended and unintended links between its inputs, outputs and outcomes (155). It is a theory of how and why an initiative works (156). A ToC approach is generally used to build consensus among stakeholders to agree on the inputs and processes required to achieve a program objective (155). The ToC framework that I developed was distinct in that it was not developed in collaboration with stakeholders, but rather from the results of the realist inquiry, the content analysis of stakeholder interviews and review of key documents.

Although there was no ToC framework explicitly stated in the documents reviewed, in developing my own ToC for the program, I considered what *might* have been the initial program logic in 2008, when the program commenced. I considered whether this initial program theory was appropriate or whether there may have been missing steps in the links between the inputs, processes and outcomes to achieve the program's objectives, particularly with respect to the inclusion of PHC services.

Recognising the diversity of contextual factors identified from the realist inquiry, my theory of change framework was also influenced by methods used in 'outcome mapping'. Outcome mapping recognises that people and organisations drive change processes (212). It acknowledges that whilst working in complex social programs where there are multiple stakeholders (for example beneficiaries and the national Ministry of Health), real and sustainable change is a product of the interaction of many different factors and stakeholders and is not in the realm of control of a single agency (213). Therefore, understanding and influencing change requires engaging with the different actors, their roles, relationships, mindsets and motivations (212).

Figure 4.2 shows that outcome mapping identifies three spheres from the point of view of a project: sphere of control (indicating the elements of a program that can be held directly accountable by designers and implementers), sphere of influence (indicating the project's strategies which could influence yet which is also influenced by multiple other factors), and sphere of interest (indicating the longer-term objectives of a project, but where it will be difficult or impossible to trace their influence) (213, 214).

Figure 4.2: Diagram showing the interaction between project, partners and beneficiaries in the various spheres to create change



Adapted from Hearn 2011, International Development Research Centre (214)

4.3.5 Ethical approval

Ethical approval for this study was granted by the Australian National University Human Research Ethics Committee, protocol number 2018/061. MSF and local ethics clearance was not obtained as this field visit and it's corresponding output did not represent a research study. My role when I first went on this field visit was in an operational capacity to understand research needs. The subsequent analysis and report that is presented here is considered a part of quality improvement practices as part of standard programmatic practice. The audience of this report is internal MSF staff.

4.4 Results

4.4.1 Field visit to Jahun

In the Jahun project, I had participant observation conversations with the project coordinator, nine members of the international medical team including the medical team leader, midwife activity manager, head nurse, anaesthetist, pharmacy manager, visiting VVF surgeon and two obstetricians. I also had informal interviews with six national staff midwives in the hospital and four working

outside of the hospital, in the BEmONCs. In addition, I spoke with four medical internists and five nurses in the hospital.

In the hospital, I attended ward rounds on the post-natal ward on two occasions and once on the fistula ward. In these ward rounds, I was in an observer role, however was able to ask questions from women regarding their attitudes towards delivering at a healthcare facility, barriers to seeking care at a healthcare facility, including at the PHC-level, and their knowledge of antenatal care.

At the community level, I visited the two BEmONCs in Miga LGA and Jahun LGA, each on two occasions. In these visits, I was able to interact with community midwives and with women attending for antenatal and postnatal care. I was also able to join the medical outreach team on a community visit to a remote community, within the catchment area of JGH, where I observed the functioning of a basic community health post. With the outreach team, I participated in a workshop given to approximately 30 traditional birth attendants, where the discussion topic was on referring unwell women to hospital.

Additionally, in the community, I met and had informal discussions with five community leaders. At the Ministry of Health in Dutse, the capital city of Jigawa State, together with the project coordinator, I met with the Head of primary health care, the Head of secondary health care and the Head of health information systems for Jigawa State.

Outside of Jigawa State, I met and had participant observation conversation with the MSF Medical Coordinator and Head of Mission responsible for the Jahun project, based in Nigeria's capital city of Abuja. I also met and had discussions with the responsible medical manager for the project based in Paris and the women's health advisor based in Sydney.

4.4.2 Thematic analysis

From the analysis of project documents, participant observation conversations and from a clinical audit, I identified five main factors that could have accounted for the unchanged maternal and neonatal mortality rates in the Jahun project between 2008 and 2016. These factors are listed below with an explanation and supporting evidence of how they could have contributed to unchanged maternal and neonatal mortality rates in the Jahun project.

1. **High medical acuity of presenting patients**

Women presenting with a high level of medical acuity can contribute to unchanged morbidity and mortality rates as it may often be too late to effectively manage severe pregnancy-related complications by the time they arrive at the hospital. Upon arrival at the Jahun CEmONC, women

are first triaged. The level of severity of their presenting illness is assessed by a midwife and a decision is made on the woman's care pathway based on this clinical assessment. I found evidence for the level of medical acuity of women presenting to the Jahun CEmONC by reviewing a random selection of 30 admitted patient records. Using an obstetric triage acuity score[1] for research purposes, I found that 24 of these 30 women (80%) presented to hospital with a score of 1 (resuscitative) or 2 (emergent), indicating that they needed to be seen immediately or within 15 minutes of arrival to the CEmONC. Many of these women presented in the active phase of labour, nine to ten centimetres dilated, or they presented with post-partum haemorrhage after giving birth at home. In five of the 24 women (21%), the foetus had already died in utero at the time of admission.

This quote in a report by one of the visiting obstetricians to the Jahun project between 2013 and 2016 highlights the complexity of medical morbidity in women presenting to the hospital: *"*Jahun is the most complicated obstetric project in MSF France. Although Afghanistan is bigger, Jahun has the highest level of complications. In terms of pathology, it is the worst*"* (199, page 1).

2. Overcrowded hospital

It is evident from reports by various MSF staff members that there has always been a demand for the services of the Jahun CEmONC (199-201, 216). This has reportedly caused increased overcrowding at the hospital over the years. A medical situation report in March 2017 describes the conditions of work over that month in one of the in-patient wards at the hospital: "In March we reached the highest BOR [bed occupancy rate] ever with 217%**.** This lead to a very poor quality care in terms of hygiene, monitoring and prompt treatment" (217, page 11). The report also stated that, emergency relocation [was] required for few days due to [an] unacceptable overcrowded ward" (217, page 1).

An overcrowded hospital can contribute to maternal morbidity and mortality in several ways – by increasing the risk of nosocomial infections, by compromising the quality of patient care and by causing staff burnout.

[1] The obstetric triage acuity score includes a comprehensive set of obstetric and medical presenting complaints organised by categories of signs and symptoms. It was developed in London and has been validated for use on obstetric patients. (215. Smithson DS, Twohey R, Rice T, Watts N, Fernandes CM, Gratton RJ. Implementing an obstetric triage acuity scale: interrater reliability and patient flow analysis. Am J Obstet Gynecol. 2013;209(4):287-93.)

3. Compromised quality of patient care at the hospital

Compromised quality of patient care can contribute directly to maternal morbidity and mortality when appropriate and necessary life-saving or prolonging medical activities are not carried out as required or indicated. Reports from several visiting medical specialists commented on the need to improve the quality of medical care being provided. A comment in a report by one such medical specialist linked this aspect with the level of complex morbidity seen at the hospital, "aiming to improve quality of care when people are constantly only firefighting is quite impossible" (218, page 18). A comment in a report by a project medical manager who worked in the Jahun project between September 2017 and January 2018 referred to the disappointment in the lack of adequate care provided at the hospital: "It was a shock for me to see that in an MSF project where the centre of our interest are the pregnant and delivering women, there is no time and no space to do comprehensive care. Why do we see them only as numbers, victims, and not as individuals with rights to be respected?" (218, page 33).

During my field visit I had regular discussions with a surgeon who had been visiting the project since 2012. He indicated that quality of care had been a constant focus for medical managers at the hospital. Various efforts had been made over the years by many medical staff in different departments to work on this aspect but there was "'always more to do'".

4. Staff burnout

According to psychologists, burnout is a "prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by the three dimensions of exhaustion, cynicism, and inefficacy" (219). Although no formal diagnoses of burnout were made, I recognised symptoms of burnout among several of the staff members I interacted with. I observed that medical staff were under constant pressure to deal with multiple medical emergencies at any given point in time. Taking a break over an eight- or ten-hour shift was not always guaranteed and there was rarely an opportunity for teaching or ongoing learning. A particular conversation with a junior medical doctor, who had trained in southern Nigeria and was relatively new to the project, highlighted to me how intense and stressful it must be to work at the Jahun CEmONC. He said, "'I'm Nigerian, but I've never seen women coming into hospital knocking on heaven's door like what I'm seeing in Jahun. Down South, it's not like this. We can do more and we have more resources. This is very different to my last job'".

Staff burnout can contribute to high maternal morbidity and mortality if they feel unable to cope with the demands of the job and are not motivated to perform. This can lead to medical errors,

poor performance of routine tasks such as the measurement of vital signs, provision of timely medications and failure to recognise critically ill patients. These factors have been reported by visiting medical specialists over the years as contributing to poor patient outcomes. (199, 200, 217). A gynaecologist I spoke with said that, "'the midwives and nurses work very hard, but they are exhausted by the number of sick women they see every day. They don't always have the capacity to do the best they can'". A comment in a report by a project medical manager who worked in the Jahun project between September 2017 and January 2018 states, "It was a shock to see that since years midwives and doctors are forced to work up to the end of their physical and psychological capacity" (218, page 33).

5. Poorly defined and executed program strategy

A poorly defined and executed program strategy by MSF has contributed to unchanged morbidity and mortality rates by inadequately recognising program deficiencies and failing to implement corrective strategies.

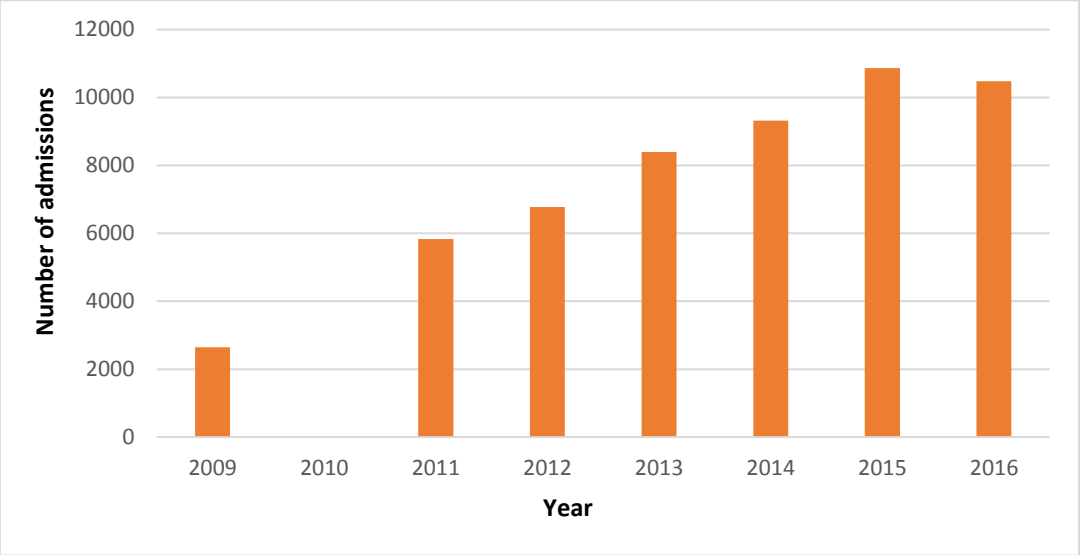
When the program was initially conceived, the intention had been to support the Ministry of Health (MoH)-run hospital for three years, while using the opportunity to increase MSF's competency in VVF surgery (199). It was explicitly mentioned in 2008 that it would be important to "maintain good collaboration with the community" to reinforce the link between the catchment population, local health facilities and the JGH (198, page 1). There was a target set at this stage to reduce the maternal mortality rate (case-fatality rate) from 4.9% to less than 2% at least in the first year.

However, as the project evolved, the outreach and community aspects of the program strategy were not further developed. The initial three-year plan gave way to an ongoing and increasing focus on the activities of the hospital. The need for MSF's intervention to provide emergency obstetric care is evident from the steadily increasing trend in admissions to the MSF CEmONC between 2009 and 2016, as shown in Figure 4.3. It was not until 2014 that the project strategy was revised to move outside the CEmONC facility and into conducting primary health care activities (201). In 2016, two BeMONCs in Miga LGA and Jahun LGA were opened in an attempt to "identify and prevent complications of pregnancy, promote the delivery of uncomplicated pregnancies outside the hospital and to assist in reducing the patient load at the MSF CEmONC" (199, page 2).

Despite the early recognition that it was important to intervene at the primary and secondary levels of health care in Jahun, the PHC aspect was dismissed for six years. Instead of taking a comprehensive approach to addressing maternal and neonatal morbidity and mortality, the strategy was executed with a short-sighted vision, reactive to the needs of the project year-on-year. A comment in a report by a former Head of Mission of the project summarises it well when he says,

"The major problem is the way we look at the project as if we wanted to close it next year. We have thought in instalment ways" (199, page 1).

Figure 4.3: Trends in admission to the MSF comprehensive emergency obstetric and neonatal care facility, Jahun, 2009 - 2016 *



* Data for 2010 was unavailable and 2016 data is until mid-December

4.4.3 Realist inquiry

The five factors identified above became the 'outcomes' of my realist analysis. With these outcomes in mind, I generated mechanisms and contexts within which these mechanisms operated that could account for the specified outcomes. The results of this analysis and the hypothesised context-mechanism-outcome configurations are presented in Table 4.1. It can be seen that while some factors are listed as outcomes, they are also the context and mechanisms for other outcomes. For an example, while the high medical acuity and volume of patients can be thought of as contextual factors leading to poor quality of care, these factors are also outcomes in themselves, as a result of a multitude of contextual factors. A further explanation of the CMOCs in Table 4.1 is given below.

Table 4.1: Context-mechanisms-outcome hypotheses that led to an unchanged maternal mortality rate at Jahun General Hospital between 2008 and 2016

CONTEXT (for whom, in what circumstance)	MECHANISM (how does it lead to outcome)	OUTCOME
Individual-level factors		**1. High medical acuity of presenting patients**
Low rates of female education	Women have low health literacy therefore there is a delay to recognise complications of pregnancy and/or labour, resulting in a delay to seek health care	
Multigravida pregnancies	Increased risk of complicated pregnancies in those presenting for care	
Level of household wealth	Women are less likely to seek care at a healthcare facility; Those who can't afford transport are not able to seek care in time	
Women's preference for home-delivery with traditional birth attendant	Complications of pregnancy are not picked up; delays in referring women to healthcare facilities	
Spousal relationship and/or relationship with husband's family	Relationship with the husband and/or his family determines the ability of the woman to seek care therefore women may not seek care in time	
Societal factors		
Role of women in society	Women are not autonomous and have to seek permission from male, elderly female or community elders to attend hospital	
Cultural practice of early marriage	Earlier child-bearing means that women in this age group have not fully developed for childbirth, resulting in complicated pregnancies and deliveries	
Health system factors		
Poorly equipped and staffed primary health care clinics	Women unable to receive adequate routine antenatal care during pregnancy therefore complications of pregnancy are not detected	
Poor quality of care at primary health care clinics, including BEmONCs	Complications of pregnancy are not picked up, inadequate health education is provided, complicated pregnancies are not referred to higher levels of care	
Non-existent or unreliable ambulance service	Delay to receive necessary health care in time	

Insufficient number of functional BEmONCs for the population	All patients, whether or not they require advanced obstetric care, seek care at the Jahun CEmONC	**2. Overcrowded hospital**
Presence of international medical staff	Perception that quality of care is better at Jahun CEmONC than at local hospitals	
MSF policy of free medical care and provision of patient meals	Increased use and accessibility by all in community	
High volume of patients	Staff working long days and not taking enough breaks	**3. Staff burnout**
Complex medical patients	Staff feel unable to provide care with available resources; repeated exposure to high levels or morbidity and mortality	
Inadequate human resourcing – not enough staff for the level of acuity of patients	Staff are constantly under pressure to perform at a high level	
Little opportunity for training and learning on the job	Staff do not feel valued and see limited opportunity for career development	
Overcrowded hospital with poor physical layout and insufficient infrastructure	Staff working in a chaotic, disorganised environment	
Lack of leadership within the project	Unable to guide program or implementation strategy adequately; failure to see the 'bigger picture' and take steps to understanding the Jahun context	**4. Poorly defined and executed program strategy**
No monitoring and evaluation framework in place	Unable to follow successes or failures of program adequately	
Unclear relationship between MSF and MoH	Strategies developed haphazardly without clear understanding from parties involved	
Poor internal accountability mechanisms	Lack of leadership within the project; responsibility passed from field to capital to HQ	
High volume of complex medical patients	Staff struggle to cope with the demands of their job and have limited capacity to follow recommended protocols and guidelines	**5. Compromised quality of patient care at Jahun CEmONC**
Low resourcing for the volume and complexity of patients		
Staff burnout	Staff leave the project early resulting in gaps in human resources, worsening staffing ratios	

MSF = Médecins sans Frontières; MoH = Ministry of Health; BEmONC = Basic emergency obstetric & neonatal care; CEmONC = Comprehensive emergency obstetric & neonatal care; HQ = headquarters

4.4.3.1 ***Outcome One: High medical acuity of patients***

Broadly, the contexts in which women present with a high level of medical acuity relate to individual-level factors, societal factors and health-system-level factors. From the literature on women in northern Nigeria, I discovered that individual-level factors such as a woman's level of education (220, 221), her level of household wealth (222) and the number of live births that she has had (223-225) may contribute to presenting with high medical acuity at a health facility during pregnancy. The mechanisms associated with these contextual factors relate to a failure to recognise complications of pregnancy by the woman herself and by health staff, high-risk pregnancies and mostly, women delaying seeking necessary health care.

Rates of female education in northern Nigeria are understood to be very low – between 68 and 74% of women have had no formal education at all, including primary school (180, 181). This could also translate into low health literacy and as a result, women may fail to recognise complications of their pregnancy and/or labour and delay seeking health care.

The fertility rate in northern Nigeria is approximately 6.5, compared to 4.5 in southern states (226). This means that the likelihood that a woman is grand multiparous (defined as having had five or more live births (227)) in northern Nigeria is high. Women who are grand multiparous are at increased risk of adverse obstetric outcomes such as malpresentation, labour dystocia, postpartum haemorrhage, perinatal mortality, and other complications of pregnancy (228). Therefore, if a grand multiparous woman can get to the Jahun CEmONC, she is more likely to present with a complicated pregnancy. My own observations confirmed this. It was not unusual to meet a woman on a hospital ward round who had just delivered her seventh or eighth child.

The northeast and northwest zones of Nigeria are reported to have the lowest levels of household wealth in the country (229). This has shown to be associated with lower reproductive health-seeking behaviours (229). I gathered from interviews that it can also lead to a woman's inability to afford transport and seek health care in time.

From interviews with patients and staff, I learnt that a woman's preference for home-delivery and her relationship with her husband and husband's family may also contribute to presenting with a high level of medical acuity. This is also reported in the literature (222). There is a strongly held cultural belief that only 'weak women' deliver in hospital. One woman also said that women in Jahun are expected to "'bring the baby out silently just like the baby was put in silently'". I learnt that if a woman does deliver at home, this is often with the assistance of a traditional birth attendant, many of whom are untrained and unskilled. Delivery in the absence of a skilled birth attendant is a key identified risk factor contributing to maternal morbidity and mortality, particularly in developing

countries (230). An unskilled birth attendant may not adequately or accurately pick up complications of pregnancy and may not refer women to healthcare facilities that are able to provide the level of care required.

Even if a woman does want to deliver at a healthcare facility, the decision to seek health care is not always up to her. Many women I spoke with at Jahun have to get permission from their husbands or mothers-in-laws to seek health care, be it primary or secondary health care. If a woman is not given permission to seek care by her husband or close relatives, then she will not be able to receive health care in time.

Closely linked to the above is a general societal-level factor regarding the role of women in Jahun society. My interviews with women from Jahun revealed that women are not autonomous in their society and have to rely on their husbands, husband's family members or community elders for decision-making, including decisions related to their health care. Women I spoke with conveyed that if a woman has a bad relationship with these family members, she will not be able to receive the health care that she needs. This finding is supported by a study conducted in Nigeria measuring women's autonomy using six elements in contexts where women had a voice. It reported an inverse relationship between indicators of women's autonomy and the likelihood that she would deliver with 'no one present' (231).

The literature also identified that there is a practice of early marriage in northern Nigeria; it is estimated that two-thirds of girls in rural northwest Nigeria are married by age 15 (179). This was confirmed by my own discussions. I met married girls as young as 13 or 14 in Jahun. Early marriage results in pregnancies in young women whose bodies have not yet fully developed to carry a pregnancy (232). This can result in complicated pregnancies and deliveries, including obstructed labour, pre-term delivery and stillbirth (232, 233).

From my visits to primary health care centres (PHCCs) and from data collected by MSF on PHCCs in the JGH catchment area, I found several health system level factors which can result in a high level of medical acuity among presenting patients. These include the lack of PHC facilities for routine antenatal care in parts of the catchment area, poor quality of ANC delivered in existing PHCCs and an unreliable ambulance system.

Visits to PHC facilities made it clear that there are various levels of PHC facilities available within the JGH catchment area. A PHCC is one that is open 24 hours a day, is staffed by nurses and midwives, with or without a medical doctor. At a PHCC, women can access birthing care and receive ANC. A PHCC is the equivalent of a BEmONC in this area. The next level down from a PHCC is a health clinic, which is open from Monday to Friday and is available for general medical consultations. These are

usually staffed by a nurse or a community health extension worker (CHEW) and there are no midwives. A health post is similar to a health clinic but is smaller and is usually run by a CHEW. It offers only outpatient consultations and runs from Monday to Friday, from the morning until 2 pm. In the JGH catchment area, data from the Ministry of Health state that there are three PHCCs, 32 health clinics and 21 health posts.

Both the health clinic and health post conduct ANC consultations. However, these facilities are insufficiently equipped and staffed. Many of the smaller health posts that I visited are only staffed by community health workers. They may lack the necessary skill, equipment and training needed to effectively perform their job. I reviewed some ANC health cards, and found that almost all of these were only partially filled, medical examination information was missing and routine medical tests were not performed. Staff claimed that drugs and equipment were missing, including those necessary for routine ANC such as urinalysis and testing for diseases such as HIV and syphilis. The inability of many women to receive adequate ANC during pregnancy may result in complications of pregnancy going undetected and subsequently, later in pregnancy, result in presentation to a secondary healthcare facility with a high level of medical acuity.

I found that even when women were able to access antenatal care, the quality of care received was poor. From an informal audit I conducted among 35 women admitted to the VVF ward with an obstetric fistula, I found that 23 of the 35 (66%) had actually received ANC during the pregnancy in which they developed a fistula. These 23 women had made an average of four ANC visits during their pregnancy. All 23 reported delivering at a healthcare facility, although many reported waiting at home for one to two days prior to coming. Despite these seemingly favourable healthcare-seeking statistics, only one of the 23 women had delivered a live foetus and all had developed a fistula. One woman said that because she had attended ANC four times during her pregnancy, she thought there was no need for her to come to a healthcare facility to deliver, even after being in labour for two days. This raises questions on the quality of ANC delivered at primary healthcare facilities and the quality of health education and information given to women.

When I visited remote communities within the JGH catchment area with MSF community health workers, it was clear that geographic access would be a clear barrier for women in need of advanced obstetric care within these remote communities. Some communities had access to an ambulance service which was funded by a local non-government organisation (NGO), while others did not. In the communities for which there was an ambulance, community members would state that the service was unreliable, the ambulance may be missing or out of petrol or dysfunctional. A non-existent or unreliable ambulance service means that women are not able to access the level of obstetric care they need in time.

4.4.3.2 ***Outcome Two: Overcrowded hospital***

The contextual factors which lead to an overcrowded hospital include a lack of local infrastructure, the presence of international medical staff, free medical care at the MSF CEmONC and a low availability of hospital beds.

The acceptable level of emergency obstetric care for a population is at least five EmOC facilities (including at least one comprehensive facility) for every 500,000 population (192). The Jahun catchment area, with a population of over 460,000 has three functioning EmOCs including one CEmONC. There are other facilities in the catchment area which claim to be BEmONCs; however, from visits made to these facilities and from reports by various MSF staff members over the years, these are ill-equipped, poorly staffed and poorly skilled. The insufficient number of functional BEmONCs for the population leads to all patients seeking care at the Jahun CEmONC, whether or not they require this level of advanced care. This leads to overcrowding at the hospital.

Interviews of patients and staff revealed that the presence and provision of care by international medical staff at the CEmONC results in a perception among the local community that the quality of care provided at this facility is better than at other local hospitals. This has led to women seeking care from outside the catchment area, including from nearby Niger, resulting in overcrowding.

The MSF policy of providing free medical care and providing patient meals is an attractant for many in the community. At neighbouring Ministry of Health hospitals, patents must pay out-of-pocket for all aspects of care and few can afford this. This results in women preferentially seeking affordable care at the Jahun CEmONC, thus increasing patient load.

4.4.3.3 ***Outcome Three: Staff burnout***

There were several factors linked to the working environment within the Jahun CEmONC that likely led to staff burnout. Evidence for these factors were from interview data and supported by my own observations.

Staff burnout is as a result of a high volume of patients which often results in long working days and an inability to take regular breaks. The medical complexity of presenting patients means that staff feel unable to provide adequate care with available resources. The literature also suggests that repeated and ongoing exposure of death and dying can lead to burnout among medical staff (234).

Reports from MSF medical advisors comment on the inadequate levels of human resources for the complexity of medical patients seen. This has resulted in staff being under constant pressure to meet the high demands of their job. Several staff members also reported that there is limited

opportunity for training and learning on the job, resulting in a sense of feeling undervalued and without opportunity for career development.

I also observed that overcrowding at the hospital together with insufficient hospital infrastructure such as the physical layout of the hospital, the number of available beds, among other variables, can lead to a feeling that staff are working in a chaotic and disorganised environment in which they have little control. These can all contribute to staff burnout.

4.4.3.4 ***Outcome Four: Poorly defined and executed program strategy***

The contextual factors leading to a poorly defined program strategy stem from organisational level factors specific to MSF. A lack of leadership and ownership over the project has resulted in short-term strategies that fail to address the underlying causes of the ongoing problems faced at the CEmONC. An inability to adequately recognise the complexity of the context and develop appropriate strategies has contributed to the current state of the project. Further, responsibility for program inadequacies were passed from field staff to the management team in the capital to headquarters-staff and vice versa. This lack of ownership for the project has contributed a poorly-defined program strategy.

The absence of a monitoring and evaluation framework has meant that program managers have not been able to follow successes or failures of the program adequately and consider how and in which aspects the program needs to adapt. When I further enquired about this aspect from responsible medical managers, their response was that these frameworks are over-prescriptive and do not allow for flexibility in approach. However, its absence has led to the development of 'solutions' and strategies which are short-term focused and fail to address the bigger picture.

This lack of a long-term approach to MSF's intervention strategy has been felt by MSF staff within the project and by MoH staff. Although the relationship between MSF and senior MoH staff was reportedly sound, a report identified that MoH commissioners wished MSF had a "comprehensive and long-term strategy" (199, page 11). Staff within MSF were themselves frustrated by what seemed like an unclear relationship between MSF and the MoH, wanting MSF to lobby the government to do more for the women of Jahun. A comment in a report from an MSF medical manager captures this sentiment when she says, "MSF as an organisation could assist the MoH and together with others pressure donors and the Government to do more than promise to reimburse some drugs for pregnant women. The actual [MoH] programs are very superficial and will not change the situation that is since years an emergency that women and children are not cared for at all levels" (218, page 33).

There were poor internal accountability processes within the project, conveying a sense that no one was responsible for the project. I observed frustration by the medical team in Jahun on day-to-day decisions that were stalled, due to a lack of answers and clarity given by program managers at the capital-level. However, there were no immediate repercussions for this inaction.

4.4.3.5 ***Outcome Five: Compromised quality of care***

My observations and interviews with staff members identified that the contextual factors leading to compromised quality of patient care are indeed a culmination of previously described outcomes and contexts. The high volume of complex medical patients, the low level of resourcing to deal with this volume and staff burnout all contribute to compromised quality of care from similar mechanisms. These are that staff struggle to cope with the volume and level of medical complexity and don't have the capacity to follow recommended protocols and guidelines. Staff burnout also results in some leaving the project early, causing gaps in service provision, further worsening the available number of human resources and contributing to compromised quality of patient care.

4.4.4 Theory of change and outcome mapping

4.4.4.1 ***Hypothesis of the initial program logic***

The initial program logic identified that it was important to intervene at both the primary and secondary levels of the health system in order to reduce maternal and neonatal morbidity and mortality. However, it was not until 2014 that any attempts were made to intervene at the PHC level. It is unclear from the existing documents why this aspect was not developed earlier. However, it is conceivable that program managers considered that CEmONC activities alone could achieve the objectives of the program and/or it was believed that PHC services, including BEmONC and ANC activities, were well-covered by the MoH. However, this was not the case. As already highlighted, coverage of services at the PHC level was inadequate, with deficient infrastructure and poor quality of care.

What was missing from the program logic at that time was the investment into essential PHC services, such as a sufficient number of well-equipped BEmONC facilities with trained staff, provision of quality ANC and community engagement. Without adequate coverage and quality of ANC and BEmONC services, it is difficult to expect that CEmONC services alone would address the majority of the burden of maternal and neonatal morbidity and mortality, unless the CEmONC was of equivalent coverage. An understanding of the health system and the levels of intervention needed at every level were important for MSF mangers to consider at the time. This lack of a comprehensive approach likely contributed to the ongoing problems faced at the MSF CEmONC facility.

*4.4.4.2 **Findings from realist inquiry***

The realist inquiry highlighted that in order to achieve the intended program objectives of reducing maternal and neonatal morbidity and mortality, there were factors involved at individual, societal, organisational (MSF) and health system (MoH) levels, as shown in Table 4.2. These factors were all considered in developing the 'informed' theory of change.

Considering these various and inter-related contextual factors among key stakeholders of the project, namely MSF, the Ministry of Health and patients, the theory of change outlines four major domains which can be broken down within the spheres of control and influence to achieve the sphere of interest, as shown in Figure 4.4.

The main factors within MSF's sphere of control, and recommendations relating to these factors, are:

- **Governance and partnership** – MSF must work in collaboration with the local Ministry of Health and the community to lobby for the changes required to achieve the program's main objective of reducing maternal morbidity and mortality. This is particularly important when considering the level of infrastructure required at the primary and secondary levels.
- **Well-functioning emergency obstetric and neonatal care facilities** – MSF can ensure that the CEmONC and BEmONCs under their management are fully resourced with the adequate medical supplies, equipment and drugs required. They can ensure that staff are adequately trained according to evidence-based protocols and are given opportunities for continuing professional development, to ensure that medical care is delivered safely. In addition, a reliable and functional referral system must be in place between primary and secondary levels of care.
- **Community engagement and assessment** – MSF can take steps to better understand the local context and factors influencing health service delivery and health-seeking behaviour in the community it serves. This may include conducting more in-depth anthropological studies or working closer with local partners. This aspect of community engagement also includes working with traditional birth attendants to encourage them to refer women to healthcare facilities, and incentivisation could be considered. Community engagement should also include health education at healthcare facilities and among the wider community to improve health literacy, particularly around the danger signs of pregnancy-related complications.
- **Monitoring and evaluation –** MSF needs to develop a monitoring and evaluation framework to ensure that ineffective strategies are abandoned and those that have proven to be effective are continued.

Table 4.2: Classification of contextual factors from the realist analysis according to the agent-in-control and level of health system

Agent in control	Community level	Primary health care level	Secondary health care level
Society	• Women's place in society • Early marriage		
Individual	• Level of education • Level of household wealth • Birthing practices • Level of gravida • Perception of care	• Accessing health care on time	
Médecins sans Frontières	• Community assessment and engagement • Health education	• Resourcing of health facilities – beds, staff, equipment, supplies • Training and development of staff • Relationship with Ministry of Health • Relationship with community • Monitoring and evaluating activities	• Resourcing of health facilities – beds, staff, equipment, supplies • Training and development of staff • Relationship with Ministry of Health • Relationship with community • Monitoring and and evaluating activities
Ministry of Health	• Community engagement • Analysis of needs	• Ensuring adequate number of available and functioning health facilities at the community level (primary health care clinics and BEmONCs) • Ambulance availability and reliability • Maintaining supply of drugs and supplies to PHC clinics and BEmONCs • Staff training and supervision • Continuous quality improvement practices	• Ensuring adequate functioning of secondary healthcare facilities in catchment area • Ambulance availability and reliability • Maintaining supply of drugs and supplies to secondary healthcare facilities • Staff training and supervision • Continuous quality improvement practices

The factors outside of the project's control but within the 'sphere of influence' relate to how beneficiaries and partners engage with the project and MSF. The sphere of influence relies on the government investing in local health infrastructure to ensure that minimum standards are met, and on medical staff following protocols and guidelines, applying knowledge and referring women appropriately between primary and secondary levels of care.

The sphere of influence also relies on women changing behaviour so that they seek health care early and attend a healthcare facility for delivery. Acknowledging that women in Jahun do not necessarily have the capacity to make their own decisions, it is envisaged that by influencing the wider community, the decision-makers in women's lives will allow women to seek care when needed. Family members, traditional birth attendants and community elders are also involved and necessary to make this change happen.

Figure 4.4: Theory of change for the MSF Jahun project

	Governance and partnership	Well-functioning emergency obstetric and neonatal care facilities	Community engagement and assessment	Monitoring & evaluation of activities
Assumptions	• A memorandum of understanding will be respected • State government is interested in improving health services in Jahun • Community leaders, local NGOs and persons-of-influence are willing to engage with MSF	• Women are willing to seek care at primary and secondary healthcare facilities • MSF is willing to invest further in the Jahun project • MSF staff are interesting in ongoing professional development and self-improvement • Local supply chains work well to ensure that MSF facilities do not face ruptures in equipment, drugs and supplies	• MSF is willing to perform community engagement activities • Community members are willing to engage with MSF • Traditional birth attendants are willing to engage with MSF • Individuals are willing to change current practices and behaviours	• Monitoring and evaluation activities contribute positively to a program's development
Sphere of Control	• MSF develops a **clear and accountable** memorandum of understanding with the MoH • MSF lobbies government to **invest in sufficient health and road infrastructure** as required for the catchment population • MSF **engages** with community leaders, local NGOs and persons-of-influence to **develop community outreach activities**	• There are sufficient **equipment, drugs and supplies** available at all MSF facilities and MSF supports local primary health care clinics with these as appropriate • There are locally-adapted clinical **protocols and guidelines** in place at MSF facilities and staff are trained on them • **Human resource** needs are planned according to the volume and medical acuity of patients. Staff are trained on the job with opportunity for career development • There are **hygiene standards and universal precautions** in place at MSF facilities • There is a **reliable and functional referral system** in place between primary and secondary levels of care	• MSF **engages** with **community members, including women, men and leaders** to better understand barriers to effective service delivery • MSF **engages and works with traditional birth attendants** to increase community referrals to healthcare facilities • **Health education sessions** are given at healthcare facilities and in the community	• MSF **develops a monitoring & evaluation framework** for the project • MSF **adapts program strategies** according to findings of monitoring and evaluation
Sphere of Influence	• There is a mutually beneficial relationship between MSF and MoH • State government **invests** in primary and secondary health facilities, including BEmONCs & CEmONCs sufficient for catchment population • State government **invests** in road/transport services including ambulances • Community leaders **engage** in MSF activity	• Women **receive** care that is safe, effective and dignified • Medical staff **apply** training and new knowledge to their practice • Medical staff **follow** recommended protocols & guidelines • Staff **appropriately refer** women between BEmONCs and CEmONCs according to their condition	• Decision-makers in women's lives **allow women to seek health care** when needed • Traditional birth attendants **refer women** to health facilities as indicated • Women **take up** health education messages and seek health care during their pregnancy	• Care is delivered that is **context-specific and locally adapted**
Sphere of Interest: Maternal and neonatal mortality ratio reduced to less than 1% in the catchment population				

4.5 Discussion

This chapter reports on the contextual analysis of a MSF maternal health care project in northern Nigerian operating for close to nine years, at the time of study. Health indicators for women and neonates in northern Nigeria are some of the worst in the world (173). This has been compounded by decades of internal instability and conflict caused by insurgencies and terrorist activity, causing further strain on the existing health system. Findings from this analysis demonstrate that providing maternal health care in a setting such as Jahun is complex. In-depth analysis of the project identified important social, cultural, organisational and health-system level factors that had an overall impact on unchanged maternal health outcomes over the course of the project. I argue that during implementation, while MSF considered a *comprehensive facility* for obstetric care, what was missing was a *comprehensive approach* to reducing maternal morbidity and mortality. There are lessons to be learnt about the identification of relevant contextual factors and integration of care between primary and secondary levels that may be applicable to other similar contexts of high maternal morbidity and mortality.

Pawson and Tilley state that "all social programs involve the interplay of individual and institution and of structure and agency" (208). They go on to say that, "a program may fail when program mechanisms fail to fire because they are introduced into an 'inhospitable context' which continues to sustain the 'problem mechanisms'" (208). The MSF project in Jahun may be such an example of program failure, at least as it relates to overall impact on maternal morbidity and mortality.

Jahun is a context in which important cultural, religious and social traditions play an important role on women's lives. Similar to other towns in northern Nigeria, it comprises a society with low rates of female education compared to the national average, (180, 181), and where early marriage and childbearing practices are common (235). In its initial intervention strategy, MSF failed to recognise that these important social and cultural factors could play a crucial role in the ability of women to seek and access health care during pregnancy. It may not be possible for MSF to *change* these aspects of society; rather, it is more important that MSF and international actors working in these kinds of settings, take steps to *understand* the context within which women seek care and the barriers they may face in accessing care. International actors have to consider the question: "What are the social and cultural conditions necessary for change mechanisms to operate and how are they distributed within the program context?" This will allow intervention strategies to be developed which are appropriate for the context and in keeping with the needs of the community.

In MSF's initial intervention strategy, the plan was for a short-term project, aiming to provide emergency obstetric care at the secondary health care level and treating women with VVF. However,

over time, the significant amount of unmet obstetric need in Jahun had become apparent, requiring MSF's ongoing presence. This change to a longer-term intervention was not paralleled by a broader strategic outlook, to consider interventions at the community and PHC levels.

An approach early in program design that MSF may have considered is community outreach and engagement. There is evidence to show that community approaches such as health education and health promotion can have a significant impact on reducing maternal outcomes, even in complex settings such as Jahun. For example, a study conducted in a remote, resource-poor region of Niger (a similar context to Jahun), showed that by spreading a simple message that 'the sun must never rise twice over a woman giving birth', the birth-related maternal mortality fell by 73% over the three year study period, early perinatal mortality fell by 62% and no deaths due to obstructed labour were reported after the lead-in period (236). There is real opportunity within the Jahun project to increase activities at the community level to include health education and health promotion.

Another aspect of context that would have been useful for MSF to understand from the project's inception is the wider health system in which the project is situated. This particularly relates to the role and capacity of the local Ministry of Health. The initial needs assessment should have included aspects such as the availability and geographical distribution of emergency obstetric facilities, including BEmONCs, and their capacity to provide safe care, the availability of PHCCs to provide adequate antenatal care, the presence of adequate referral systems including ambulance services at the PHC level and of outreach education and health promotion programs in the community.

In Jigawa state, the government of Nigeria has two main programs that aim to reduce maternal and infant mortality, the Saving One Million Lives (237) and the Maternal Neonatal and Child Health programs (238). They function by reimbursing institutions for drugs given to pregnant mothers and children under the age of five in primary and secondary care settings. While these programs have allowed for many women and children to receive health care, local healthcare facilities have been unable to cope with the high patient demand (218). These programs have suffered from a lack of funding for qualified technical staff, training, supervision, equipment and maintenance (218). Secondary care facilities are 'cost-recovery centres', so patients must pay out-of-pocket for all aspects of care. Only a few can afford to pay for care. As a result of this, JGH has become a main referral hospital for the entire state, even extending beyond the borders of the state, as knowledge has spread that there are specialized services available continuously and that services are without financial cost to the patient. While MSF cannot provide all aspects of care and its role is not to take over from the national health system, it does have to adjust its expectations and strategies according to the capacity of the national health system.

The concept of emergency obstetric and newborn care was introduced by WHO, UNICEF, and the United Nations Population Fund (174) in 1997 as an organising framework for the delivery of evidence-based clinical services, as a critical component of any program aiming to reduce maternal and newborn mortality (191). The justification for opening and investing in a CEmONC in Jahun in 2008 was to provide emergency obstetric care at the secondary health care level and provide access to emergency, life-saving surgery and fistula repair. However, evidence suggests that a maternal health care system focused only on improving secondary-level obstetric care without adequately covering services at the PHC level will not achieve reductions in maternal morbidity and mortality, particularly in LMICs (239). In childbearing, women need a continuum of care to ensure the best possible health outcome for them and their newborns (230). The first WHO guidelines on 'Essential elements of obstetric care at first referral level' states that the district or subdistrict hospital or health centre holds a key place in the organisation of maternal care (239). Pregnant women, particularly those at high risk of complications during pregnancy, require access to essential medical interventions provided at EmOC facilities to ensure favourable maternal and foetal outcomes.

There were two functional BEmONCs in Jahun for a catchment population of 461,000. It is recommended from the WHO guidelines that there should be at least five EmOCs, including at least one comprehensive facility, for every 500,000 population (192). This meant that only half the recommended number of BEmONCs were available to women in the catchment area in which the CEmONC was located. Many maternal deaths occur at first referral either because women come from too far and arrive too late, or because the essential obstetric care they urgently need is not available (182, 230, 239). Indeed, my own interviews with women admitted with an obstetric fistula said they had presented to health centres but they were either turned away or referred on to secondary care, but were unable to reach these advanced care facilities in time. This is a tragedy.

The three-delays model is a widely known model used to explore individual and facility-level factors related to maternal morbidity and mortality (240). Initially, I considered using this model as a method of analysis for the Jahun project. However, only using this model reduces the scope to investigate organisational-level factors that may have contributed to poor maternal and neonatal outcomes in this project. Using realist inquiry and an exploration of contextual factors allowed for the development of a theory of change framework that also includes more organisational aspects. The theory of change presented here was developed in an attempt to describe a comprehensive approach to achieving the original program objective of reducing maternal morbidity and mortality in the catchment population. The development of this conceptual diagram takes into account the distinctive health characteristics and contextual influences of this unique population in remote northern Nigeria. It also takes into account key recommendations of global experts who endorse

that high-quality EmOC should be universally available and accessible, that all women should deliver their infants in the presence of a professional, skilled birth attendant, and that these key services should be integrated into health systems (192). The theory of change acknowledges that there are some activities within MSF's control while others are outside of MSF's control but within its sphere of influence. Among the activities that MSF can control are the way in which it interacts with key stakeholders of the project, namely the government, at national and state level, community leaders, people of influence and local NGOs and the community. MSF can also ensure the safe functioning of the EmOCs for which it is responsible. This means ensuring the availability of adequate equipment, drugs and supplies, having protocols and guidelines in place with staff trained in these, and planning human resource needs according to the volume and acuity of patients. The referral systems between communities and health facilities also need to be strengthened. Underlying these activities and processes are important assumptions. Some of these assumptions relate to societal structures and the willingness of different members of the community to change behavior. Ultimately, the success of the program will be contingent on these underlying assumptions being addressed by all involved parties.

While the first two domains of governance and partnership and functioning health facilities have been considered in MSF's intervention strategy, the community engagement and monitoring & evaluation domains have not previously been considered. As discussed earlier, there is great opportunity for MSF to engage with the community to better understand and assess community-level barriers for service uptake that can be addressed by MSF.

An aspect of health service provision which is completely lacking on this project is a mechanism for monitoring and evaluating activities to ensure continuous quality improvement. Monitoring and evaluation of health programs is essential to understand whether interventions put in place have achieved the desired goals of the program and to assess the quality of interventions (241). The lack of an effective monitoring and evaluation framework has made it difficult to analyse progress in the project over time as activities have changed. With the addition of BEmONC activities to the project, it is important that these activities are monitored on a regular basis to inform managers on whether activities are meeting intended objectives.

A strength of this study was that perspectives of a wide range of stakeholders in the Jahun project were considered, including patients, community members, national Ministry of Health staff, MSF nurses, midwives and doctors and program managers. This allowed for the generation of common themes from multiple different sources. Limitations of this study include reliance on historical documents without a mechanism for objective verification. As a result, I may not have identified other important factors relevant to the project outcome of reducing maternal morbidity and

mortality. Another limitation is that my role as a short-term visitor on the project may have led some interviewees to be less candid in their comments. On the other hand, others may have felt less inhibited to discuss their concerns to an individual who they knew would not negatively influence their ongoing work on the project. My interviews with staff at the hospital were restricted to those available for discussion during working hours and on days I was present at the hospital. Therefore, I may have missed hearing the perspectives of others who were not present on the days I was at the hospital. The contexts and mechanisms presented here are based on a four-week field visit during which I formed most of my impressions of the project. I acknowledge that this is a relatively short period of time in which to gather information and gain an in-depth understanding of context. More time and interaction would have allowed me to gain deeper insights into the context and the project. Another limitation is that I developed the theory of change from my own analysis and insights, although it was informed by interviews and document review. A theory of change is usually developed in consultations with stakeholders through workshops or interviews, although it has been reported that the participation of stakeholders can vary substantially in practice (242).

Lessons learnt in analysing this program through a realist lens may be relevant and applicable to other maternal health care projects aiming to reduce maternal morbidity and mortality, particularly those with a focus on integrating care at the community, primary and secondary levels of care. In saying that, this study also showed that 'one size does not fit all'. Transposing the findings from this study may not work in other settings, which may operate in different contexts, triggering different mechanisms. It is essential that international actors providing health services take time to understand and analyse context, especially the role played by social and cultural factors in health-seeking behaviour and service utilisation. Context-specific and locally-adapted programs are essential if we are to truly make a difference in reducing global maternal and neonatal outcomes.

Chapter 5 Background to MSF's intervention in the Bekaa valley, Lebanon

5.1 Preamble

This chapter provides background to Chapters 6 and 7, which both investigate aspects of PHC service delivery in a MSF PHC project in the Bekaa valley in Lebanon. In this project, I acted in an operational role as medical team leader over a three-month period between August and October 2016.

Chapters 6 and 7 are specifically focused on persons accessing care for non-communicable diseases at four MSF clinics across the Bekaa valley. The aim of this chapter is to firstly, provide a brief overview of the Syrian conflict leading to MSF's intervention in Lebanon, secondly, give background on the provision of care for NCDs in humanitarian emergency settings and finally, provide a description of MSF's intervention in the Bekaa valley.

5.2 Syrian conflict and its impact on Lebanon

The Syrian conflict, ongoing since 2011, has been described as the "biggest humanitarian and refugee crisis of our time" by the current UNHCR High Commissioner (243). As of April 2018, more than 6.6 million people are internally displaced within the country and over 5.6 million people have fled Syria, seeking refuge in the neighbouring countries of Lebanon, Turkey, Jordan and beyond (243, 244). As of October 2016, just over one million refugees officially resided in neighbouring Lebanon (244), with unofficial estimates closer to 1.5 million (245). With a permanent population of five million, Lebanon currently has the highest ratio of refugees per capita in the world (246).

In Lebanon, there are no official camps for Syrian refugees. The majority of Syrian refugees live in informal settlements across 1,600 villages, concentrated in the poorest regions of Lebanon: the Bekaa valley and north Lebanon (247). The Bekaa valley, due to its close proximity to the Syrian border, has been particularly affected by the consequences of the Syrian conflict. This region has received the highest number of Syrian refugees in Lebanon, and as of May 2016, hosted 69% of all informal settlements in the country (248). It has a Lebanese population of approximately 540,000 (249) and some 365,555 Syrian refugees were registered in the Bekaa valley by May 2016, reflecting a 67% population increase between 2012 and 2016 (248). The region has also been affected by political instability, sectarian clashes and high levels of military activity, restricting the movement of the civilian population (248). The summer and spring of 2014 in particular, saw regular shelling in the towns of Hermel and Arsal in northern Bekaa, resulting in several deaths and injuries, as well as

generating an overall sense of insecurity (250). Tightened security measures have included enforcement of security checkpoints throughout road networks of the Bekaa valley region by the Lebanese Armed Forces and local police (245). Insecurity has also caused displacement of both local residents and refugees within the Bekaa valley and compromised humanitarian activities, particularly in the northern parts of the Bekaa valley (248).

The influx of Syrian refugees has caused significant strain on the Lebanese health care system, which is known to be highly privatised, expensive and focused on curative services (247, 251). Services for Syrian refugees in Lebanon are provided by the Lebanese Ministry of Public Health (MoPH) and Ministry of Social Affairs (MoSA), in addition to local and international NGOs (252). Syrian refugees are known to preferably seek health care at primary health care centres (PHCCs) (252, 253). Those refugees registered with UNHCR pay a fee of 3,000 to 5,000 Lebanese pounds (LBP) per medical consultation (approximately $2 to $3 US dollars) at a PHCC (247). For laboratory and diagnostic tests, UNHCR covers up to 85% of the cost for children under 5 years, elderly over 60 years, pregnant women and other vulnerable individuals (254). The remaining 15% of the cost must be paid for by the patient. All other individuals are required to pay the full cost of laboratory and diagnostic tests. At the PHCCs, there is a 1,000 LBP handling fee for chronic disease medications for conditions such as diabetes, hypertension, asthma, epilepsy and cardiac conditions, per visit (254).

Access to secondary and tertiary level care for displaced Syrians is primarily through a network of 66 public and private hospitals across Lebanon, contracted by UNHCR (99). This UNHCR scheme covers UNHCR-registered Syrian refugees for 75% of the total cost of life-saving emergencies, and services for obstetric and neonatal care (254). The expectation is that the remaining 25% will be covered by the patient (99).

5.3 Non-communicable diseases in humanitarian emergencies

Non-communicable diseases are diseases of a chronic nature and are the result of a combination of genetic, environmental and behavioural factors (255). They are currently the leading cause of illness in the world (256). They accounted for an estimated 71% (40.5 million) of deaths worldwide in 2016 and for approximately 57% of deaths in people less than 70 years of age (premature deaths) (257). NCDs disproportionately affect people in LMICs where more than three-quarters of global NCD-related deaths occur (258, 259). Four NCDs - cardiovascular disease, cancer, chronic respiratory diseases and diabetes - are responsible for 79% of all deaths from NCDs (257). In the Eastern-Mediterranean region, it is estimated that these four major NCDs account for nearly 60% of all deaths (260). In addition, six countries in this region are reported to have the highest global

prevalence of diabetes (111). Therefore, the management of NCDs in this region poses a significant public health challenge.

In 2013, in an attempt to expedite national efforts to address NCDs, the World Health Assembly adopted a comprehensive global monitoring framework with 25 indicators and nine voluntary global targets for 2025 (261). One of the nine targets in this global action plan was to increase the availability of basic medicines and technologies for implementing cost-effective primary care interventions in both public and private facilities (261). The WHO global action plan also included the following statements regarding NCDs in humanitarian emergencies:

1. "Improve the availability of life-saving technologies and essential medicines for managing NCDs in the initial phase of emergency response";

2. "It must be ensured that the use of these services does not expose the users to financial hardship, including in cases of ensuring the continuity of care in the aftermath of emergencies and disasters"; and

3. "Deploy an interagency emergency health kit for treatment of NCDs in humanitarian disasters and emergencies" (261).

Despite these statements, there has been limited progress on addressing the management of NCDs in humanitarian settings (23, 262). It remains a significant challenge. The effective management of NCDs require interventions at the population and individual level (263). Being chronic in nature, persons with NCDs require access to a health professional at the primary care level for ongoing follow-up of their condition and to assess for complications of disease, access to a regular supply of medications, the ability to access laboratory diagnostic tests to monitor their disease status, and the ability to be referred to specialist care if there are signs of advanced disease or complications (263).

In the setting of conflict and displacement, proven strategies known to be effective in tackling NCDs become considerably more challenging to implement. The disruption of normal health services and routine drug and material supplies compounded by insecurity makes it difficult for affected populations to seek adequate care (262). Existing services may be inadequately equipped to deal with the complexity and requirements of NCD management (264). Further, secondary healthcare facilities and the required level of specialist care may not be available or geographically accessible to those who need it.

The evidence base with which to guide national and international health service providers on the effective delivery of NCD services in humanitarian settings is negligible (264, 265). A recent systematic review looking at the available evidence on the effectiveness of interventions for NCDs in

humanitarian settings highlighted the enormous gap and limited quality of evidence on this topic (265). This review found just eight studies published over the last 35 years, with gaps on the feasibility of NCD interventions in crisis settings and inadequate reporting of follow-up periods and outcomes, most of which were self-reported (265). There remains a need for data on NCD-related epidemiology and care needs in different population groups to inform decisions on the provision of NCD care in displaced populations (264, 265).

5.4 MSF intervention in the Bekaa valley, Lebanon

Médecins sans Frontières has been supporting four PHCCs in the Bekaa valley since 2012. The project originally started as an emergency response to the first wave of Syrian refugees arriving into Lebanon. The focus initially was on the provision of essential primary care services and the management of NCDs. As the influx of refugees waned and the situation stabilised, a more comprehensive primary health care program was developed with the integration of mental health, and reproductive and child health components at each clinic.

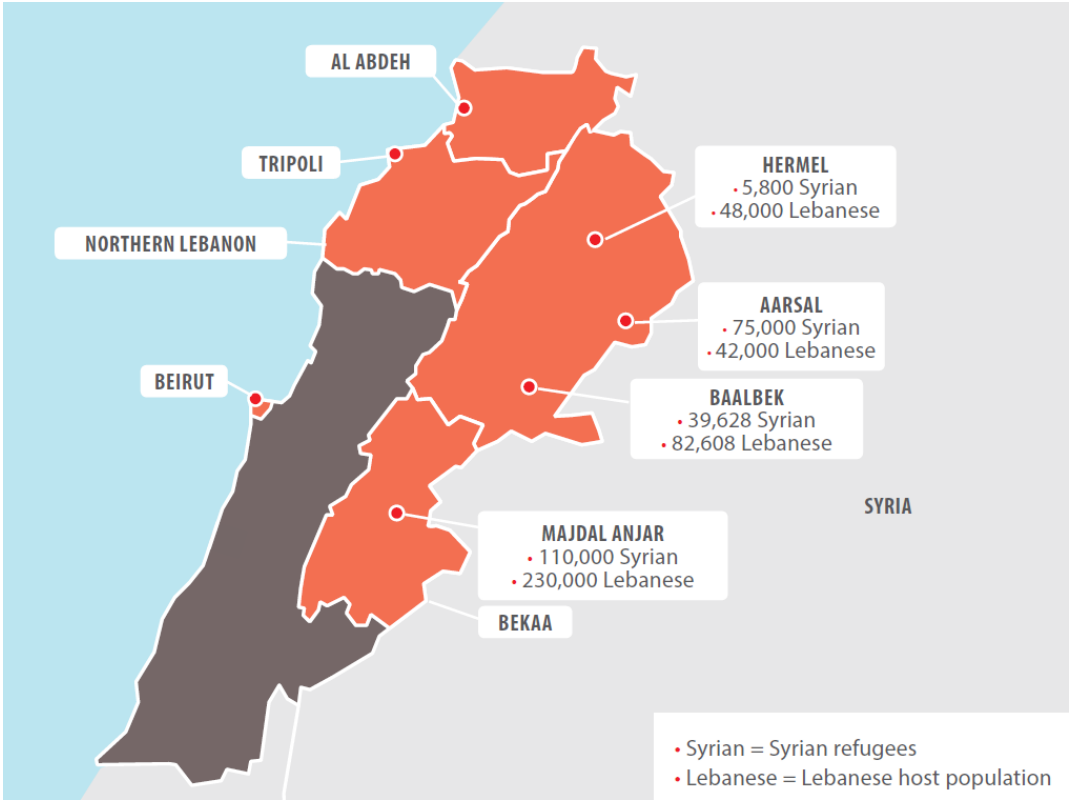
As of 2016, MSF's services in the Bekaa valley were provided in the townships of Hermel, Arsal, Baalbeck and Majdal Anjar. Figure 5.1 shows the number of Syrian refugees and host Lebanese population forming the catchment population at each of the respective MSF clinic locations, as of 31 October 2016. All screening, diagnosis and treatment services at the clinics are provided free of charge to all patients. The target population are Syrian refugees (irrespective of UNHCR registration status), Lebanese returnees from Syria, Palestinian refugees from Syria and vulnerable Lebanese. However, services are available to anyone presenting to the clinics.

The WHO highlight that NCDs can be effectively managed at the PHC level in low-resource settings (255). Essential NCD interventions at the PHC level can strengthen early detection and timely treatment of NCDs, and prevent potentially avoidable hospitalisations (263). Since the inception of the Bekaa project in 2012, MSF have invested additional resources into creating best-practice guidelines for the management of NCD patients in humanitarian settings. Within MSF, the Bekaa project is considered a pioneer in developing innovative strategies and gaining experience in this field.

Guidelines and protocols for managing types 1 and 2 diabetes mellitus, cardiovascular disease, asthma, hypertension, chronic obstructive pulmonary disease (COPD) and epilepsy have been developed by MSF. Among others, these guidelines have been influenced by policies and protocols from the WHO, the United Kingdom's National Institute for Health and Care Excellence (NICE), and the European

Society for Cardiology (263, 266, 267). General medical practitioners (GPs) and nurses at the clinics have been trained on these protocols.

Figure 5.1: Refugee and host population figures in the areas of MSF intervention in the Bekaa valley as of 31 October 2016



5.4.1 Model of NCD care at MSF clinics in the Bekaa valley

The model of care at each MSF clinic has evolved over time, continuously adapting with increasing knowledge of the context and community. By early 2016, the model of care at each clinic was similar in that it involved three pillars: case management, patient support and education counselling (PSEC) and health promotion. An individual with a NCD is consulted by a GP on three consecutive visits on a fortnightly to monthly basis, depending on the severity of illness and need for monitoring. At these visits, the GP will confirm the diagnosis, stabilise illness and initiate appropriate treatment according to MSF guidelines. After these three visits, a nurse will review the patient monthly, and refer any patients of concern back to the doctor. Each clinic has developed its own system for the proper management and follow-up of patients.

MSF covers the full cost of laboratory tests for diagnosis and disease-monitoring. Where specialists are available, referrals are made to specialised care for the further management of disease complications, particularly for conditions such as type 2 diabetes mellitus and hypertension.

Emergency cases are referred to the closest UNHCR-contracted hospital for further management.

On their first visit, all newly-enrolled NCD patients are also seen by a dedicated PSEC nurse who provides health education and counselling. This nurse is tasked with educating patients on their prescribed medications and providing advice on diet and lifestyle modifications, adapted to the resources available for refugees. For patients on insulin medication for types 1 and 2 diabetes mellitus and for those taking inhaled medications for respiratory diseases, the PSEC nurse provides specific guidance on the proper use of medical devices, in order to encourage medication compliance. In addition to the first visit, patients can be referred to the PSEC nurse as required by GPs. PSEC services are provided on a one-to-one basis in each clinic.

Within each clinic, there are also group health promotion sessions provided on a regular basis in the waiting areas. These sessions are conducted by community health workers from within the host and refugee community. At these sessions, major topics of discussion relate to modifiable diet and lifestyle behaviours, and medication compliance.

5.5 Conclusion

The provision of adequate and effective health services for persons living with NCDs in humanitarian settings remains a considerable challenge. In the Bekaa valley in Lebanon, MSF has developed a model of care at its PHC clinics which aims to address the major needs of NCD patients in a comprehensive manner. It is in this setting that the concepts of health care access, adjustment to population health needs and continuity of care are investigated in the following two chapters.

Chapter 6 Access to primary health care for Syrian refugees with NCDs in the Bekaa valley

6.1 Preamble

The focus of this chapter is on the concept of 'access' – a key concept in PHC service delivery. I specifically consider two aspects of access related to availability and geographic accessibility of health care services. I also consider the notion of *humanitarian access*, a concept familiar to international humanitarian actors but not necessarily considered in the context of PHC service delivery. All these aspects will be evaluated in the setting of service provision for non-communicable diseases at four MSF PHC clinics in the Bekaa valley in Lebanon.

As discussed in Chapter 5, due to the chronic nature of NCDs, there is a requirement for persons with NCDs to seek ongoing medical care. There is evidence to suggest that the timely utilisation of medical care in PHC settings could prevent against the development of NCD-related complications and other adverse events (268, 269). Utilisation of health services by persons with NCDs may therefore, provide an indication of the ease with which healthcare facilities are able to be accessed.

6.2 Introduction

Of the four main pillars of PHC, the concept of first-contact access is core (270-272). Starfield, a key figure in PHC services research, defined it as the point at which health services meet the population and their health needs (32). While this definition of PHC access is relatively straightforward, access to health care is acknowledged to be a complex, multidimensional concept (132, 271). The literature on this topic is diverse and plentiful, offering varying definitions and conceptualisations over time (132, 133, 270, 271, 273-275).

Having access to health care requires an adequate supply of available health services (271). According to this dimension, access to health care is concerned with the "opportunity to obtain health care when it is wanted or needed" (271). Traditional measures used to define this aspect include the number of doctors or hospital beds per capita. Based on these measures, resources can be allocated to different geographical areas or services can be optimally organised (276). Other authors have suggested that it is a limited perspective to consider that access is simply the availability of a health care facility (277). People who require services may have facilities available, yet encounter difficulties in utilising those services (277). Donabedian therefore described that the "proof of access is use of service, not simply the presence of a facility" (277).

Penchansky and Thomas developed Donabedian's idea of health care utilisation further to develop their well-known and accepted framework for health care access (133). They classified health care access by the dimensions of: accessibility, availability, accommodation, appropriateness and acceptability (133). Their research showed that while inter-related, these dimensions are distinct. Accessibility as defined by Penchansky and Thomas refers to the relationship between the location of healthcare facilities and the location of 'clients', taking account of client transportation resources and travel time, distance and cost (133). Availability is defined as the "relationship of the volume and type of existing services and resources to the clients' volume and types of needs" (133). Penchansky and Thomas' approach extended the concept of access beyond service availability, to consider the personal, financial and organisational barriers to service utilisation (271). Of the five dimensions described by Penchansky and Thomas, accessibility and availability are generally considered spatial in nature, while accommodation, appropriateness and acceptability are considered non-spatial or social (278). Measures of health facility utilisation have typically been based on volume of activity – such as the number of medical acts, number of patients seen or the number of health visits (279).

In the setting of humanitarian emergencies, where non-state actors play a major role in providing humanitarian assistance, access to health services may be affected by numerous factors. In these settings, the concept of *humanitarian access* may play a major role in access to healthcare. This idea was recognised in the literature review in Chapter 2. Military installations, checkpoints and blockades can impede the movement of affected populations, limiting their opportunity to seek care at health facilities (95, 96, 106, 114, 115, 117, 118, 122, 126-128). Similarly, international humanitarian actors may have difficulty gaining access to the affected populations due to insecurity and travel restrictions (97, 103, 104, 106, 108, 118, 120). Humanitarian access is mandated by the United Nations General Assembly, and refers to a two-pronged concept, comprising of the humanitarian actors' ability to reach populations in need *and* affected populations' access to assistance and services (140, 141).

The aims of this chapter are to explore the dimensions of access related to the availability and geographic accessibility of patients seeking care for non-communicable diseases at the four PHCCs supported by MSF in the Bekaa valley in Lebanon. Specifically, my objectives were firstly, to assess and visualise the availability of PHCCs providing NCD services for Syrian refugees in the Bekaa valley; secondly, to assess the level of accessibility to MSF clinics for those seeking care, related to travel-distance to a MSF clinic while accounting for road checkpoints; and finally, to examine whether distance to a MSF clinic affected the number of visits made by NCD patients, an indicator of utilisation.

6.3 Methods

6.3.1 Study area

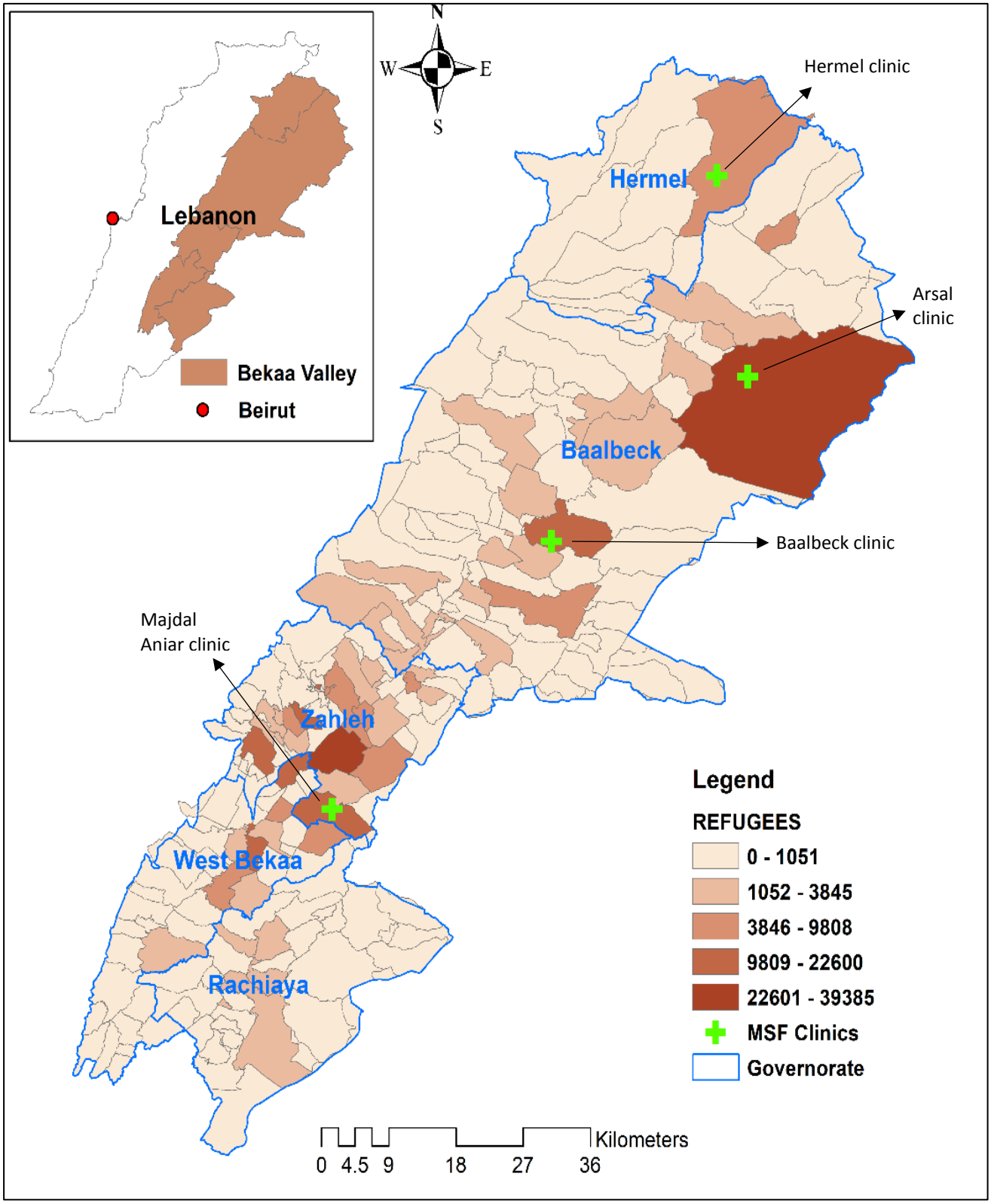
This study was carried out in the eastern region of Lebanon in the Bekaa valley – a region which shares a land boundary with Syria. The Bekaa valley with a length of 120km and width of 16kms, represents 42% of Lebanon's land area (249).

The Bekaa valley is made up of five administrative governorates consisting of 166 municipalities (280). The governorates of Baalbek and Hermel make up the northern Bekaa, Zahle is considered the economic hub in central Bekaa, while West Bekaa and Rachaiya are the two southern governorates. As of June 2016, data from the UNHCR indicate that there were 5,949 Syrian refugees registered in the Hermel governorate, 118,627 in the Baalbeck governorate, 165,756 in Zahle, 62,712 in the West Bekaa and 9,911 in Rachaiya governorate.

Figure 6.1 shows that Syrian refugees are spread throughout the Bekaa Valley. The towns of Arsal and Majdal Anjar are among those with the highest density of refugees in the Bekaa valley. MSF clinics are located in these areas of high refugee density – there are clinics in the towns of Hermel (in Hermel governorate), Majdal Anjar (in Zahle governorate), Baalbeck and Arsal (both in Baalbeck governorate).

The clinics in the Bekaa valley are all located close to the Syrian border. Although the border between Lebanon and Syria was officially closed in January 2015, Syrians continued to arrive into this region. Hermel is approximately 10 kilometres from the Syrian border and is a relatively underserved area of the northern Bekaa valley. Majdal Anjar is a small town close to the only official Syrian border-crossing and has a high concentration of informal tent settlements (ITSs) when compared to other towns in the Bekaa valley. Arsal has been held as an enclave by the Lebanese army and opposition forces since August 2014, making it extremely difficult for refugees to move in and out of the town. Baalbeck is the most developed town in the Bekaa region with most refugees living in urban dwellings and most able to access necessary services. There are numerous checkpoints in the main roads between the north and south of the valley which limit patient movements between these four clinics.

Figure 6.1: UNCHR registered Syrian refugees in the Bekaa valley as of 30 June 2016



6.3.2 Study population

The study population consisted of patients with previously or newly diagnosed non-communicable diseases (also called chronic diseases) who sought care at any of the four MSF clinics in the Bekaa valley between 1 January 2014 and 23 August 2016 (the study period) and who had complete information on place of residence. This period was chosen as it contained the best available location information on police and military checkpoints in the Bekaa valley road networks. Patients with NCDs were chosen for analysis in this study as they had individual-level medical records at each clinic, with information on village of residence. Information on those presenting with other illnesses are collected in an aggregate manner at the clinics. There were 1,698 patients with incomplete information on place of residence; 4,595 patients with NCDs were included in the study population.

6.3.3 Data sources

Syrian refugee population data was obtained from the UNHCR office in the Bekaa valley in Lebanon. De-identified patient data were extracted from the MSF health information database. Non-communicable diseases classified in the database include: hypertension (HTN), pregnancy-induced hypertension, type 1 diabetes mellitus (type 1 DM), type 2 diabetes mellitus (type 2 DM), gestational diabetes, cardiovascular disease (CVD), heart failure, asthma & chronic obstructive pulmonary disease, epilepsy and hypothyroidism. A diagnosis of CVD was considered if a patient had a current or previous history of angina, myocardial infarction and/or cerebrovascular accident. Patient locations, MSF clinics, non-MSF clinics and checkpoints were geocoded using Google Earth software.

6.3.4 Spatial analysis

A thematic map of the population density of Syrian refugees in the Bekaa valley was generated using data and shape files obtained from UNHCR in Lebanon. The geographic locations of primary health care facilities providing care and treatment for patients with NCDs was overlaid on this map.

The Sphere guidelines suggest that there should be approximately one healthcare facility available for 10,000 people in humanitarian settings (61). In the absence of guidance specifically relating to the necessary number of healthcare facilities for NCDs, I used this generic Sphere guidance. I calculated an Availability Index to measure the number of available PHCCs providing NCD services for Syrian refugees. I did this by dividing the number of clinics providing NCD services in each governorate by the total Syrian refugee population registered per governorate and multiplying by 10,000, to get a value for 10,000 people.

To calculate areas in the Bekaa valley which may have patients living with multi-morbidity, I calculated an aggregate co-morbidity score per municipality. I did this by multiplying the number of

co-morbid chronic conditions that an individual patient had with the number of patients with each of those conditions in each municipality, then adding the individual scores. These scores were then mapped using mapping tools.

The travel distance from locations of refugee residence to the nearest MSF clinics was calculated using spatial network analysis. Road network maps were used to calculate the shortest distance between places of patient residence and the nearest MSF clinic on road networks. The location of check points along road networks were modelled as a barrier to travel distance. The difference in travel distance before and after the addition of check points into the model was calculated. All spatial analysis was carried out using ArcGIS 10.4.1 software (ESRI, Redlands, CA).

6.3.5 Statistical analysis

I performed descriptive analysis of routinely collected program data for patients attending the four MSF clinics over the study period. Information collected included age, gender, ethnicity, date enrolled, registration with UNHCR, type of NCD, number of visits and follow-up time in the study period. I calculated the number of visits per patient per year using the formula: total number of visits by a patient attending a clinic / length of time in years of the patient over the study period.

To investigate factors associated with NCD patients visiting a clinic on more than 10 occasions versus less, I used chi-squared tests and logistic regression. Exposure variables were age, sex, clinic attended, NCD diagnosis, number of co-morbidities, and distance to an MSF clinic. A p-value <0.05 was considered statistically significant and confidence intervals were calculated. In multivariable analysis, variables with a p-value less than 0.1 on univariate analysis were included in the adjusted logistic regression model to control for confounding. All the exposure variables were considered to be potential confounders. All data were cleaned and analysed using Stata version 14 (College Station, TX).

6.3.6 Ethical approval

This study involved the analysis of routinely collected MSF programmatic data. The MSF Ethical Review Board has given prior approval for analysis of routinely collected data. Therefore, there was no requirement to obtain formal MSF ethical review. However, I did obtain approval for the retrospective analysis of this routinely collected data from MSF Switzerland headquarters. Ethical approval was not sought from Lebanese authorities as this analysis was considered a part of quality assurance activities within MSF. Ethical approval was granted by the Australian National University Human Research Ethics Committee, protocol number 2016/099.

6.4 Results

The majority of NCD patients presenting for care at MSF clinics in the Bekaa valley between 2014 and 2016 were from two clinics - Majdal Anjar (41% of all patients) and Arsal (39% of all patients) (Table 6.1). Most were female (58%), aged between 40 – 59 years (49%) and nearly all were of Syrian ethnicity (99%). The majority of Syrians who presented at all clinics were registered with UNHCR (81 – 89%). There were significant differences in the number of patients enrolled at each clinic by year – more than half of all patients had enrolled in Arsal clinic in 2014, whereas most had enrolled in 2015 at the other clinics. The majority of patients at all clinics had two co-morbidities (67 – 78%), while approximately a quarter of all patients presenting to the clinics at Arsal, Baalbeck and Majdal Anjar had three co-morbidities.

The median number of visits at a clinic over the study period ranged from seven at Hermel to 13 at Arsal clinic. Approximately 10% of patients made only one visit to any given clinic; this figure was 15% at the clinic in Majdal Anjar. The number of visits per patient per year was similar across the clinics with a patient making 12 visits per year on average in Arsal and Hermel clinics and 11 visits per year in Baalbeck and Majdal Anjar.

Figure 6.2 shows a map of all PHC clinics that provided NCD services for Syrian refugees in the Bekaa valley as of October 2016. This shows that there is an inverse relationship between the number of available NCD clinics and the registered Syrian refugee population. The availability index is the number of available PHCCs providing NCD services for Syrian refugees in the Bekaa valley. These indices were lowest in the governorates of Zahle and Baalbeck at 1.0 and 1.5 respectively, while in the governorates of Rachaiya and Hermel, they were 5.0 and 6.7, respectively. The Zahle and Baalbeck governorates have the highest population of Syrian refugees in the Bekaa valley while the governorates of Rachaiya and Hermel are the least populated.

The most common diagnoses seen at all MSF clinics were hypertension (55.6%) and type 2 diabetes mellitus (37.6%), followed by COPD & asthma (8.7%) and cardiovascular disease (7.9%) (Table 6.2). The clinic in Arsal saw higher proportions of people with cardiovascular disease and epilepsy compared to the others, while the clinic at Majdal Anjar saw a higher proportion of people with COPD & Asthma and type 1 diabetes mellitus.

Looking spatially at the number of co-morbidities per patient in those presenting to MSF clinics, Figure 6.3 shows that patients with the highest aggregated co-morbidity score were from Arsal town, followed by those in the central and mid-northern municipalities. Those presenting with higher comorbidity scores seemed to live in close proximity to the respective MSF clinics in each governorate.

Table 6.1: Characteristics of patients with non-communicable diseases seen at Médecins sans Frontières primary health care clinics in the Bekaa valley, 1 January 2014 to 23 August 2016

	Arsal 1802 patients N (%)	**Baalbeck 630 patients N (%)**	**Hermel 262 patients N (%)**	**Majdal Anjar 1901 patients N (%)**	**Total 4595 patients N (%)**
Age					
Median (IQR)	52 (43 – 61)	53 (44 – 63)	50 (38 – 58)	53 (43 – 62)	53 (43 – 61)
0 –17 years	102 (5.7)	30 (4.8)	26 (9.9)	145 (7.6)	303 (6.6)
18–39 years	255 (14.2)	89 (14.1)	51 (19.5)	257 (13.5)	652 (14.2)
40–59 years	895 (49.7)	305 (48.4)	134 (51.2)	926 (48.7)	2,260 (49.2)
60+ years	545 (30.2)	201 (31.9)	51 (19.5)	569 (29.9)	1,366 (29.7)
Missing	5 (0.3)	5 (0.8)	0	4 (0.2)	14 (0.3)
p-value					<0.01*
Gender, Female	1024 (56.8)	377 (59.8)	149 (56.9)	1093 (57.5)	2643 (57.5)
p-value					0.62
Ethnicity					
Syrian	1787 (99.3)	630 (100)	261 (100)	1898 (99.9)	4576 (99.7)
Lebanese	12 (0.7)	0 (0)	0 (0)	0 (0)	12 (0.3)
Palestinian	0	0	0	2 (0.1)	2 (0)
p-value					0.01*
Year enrolled					
2014	975 (54.1)	153 (24.3)	79 (30.2)	519 (27.3)	1726 (37.6)
2015	526 (29.2)	250 (39.7)	104 (39.7)	899 (47.3)	1779 (38.7)
2016	301 (16.7)	227 (36.0)	79 (30.2)	483 (25.4)	1090 (23.7)
p-value					<0.01*
Syrians registered with UNHCR	1537 (86)	514 (81.6)	222 (85.1)	1701 (89.6)	3974 (86.8)
Number of morbidities					
One	64 (3.6)	34 (5.4)	10 (3.8)	78 (4.1)	186 (4.1)
Two	1,222 (67.8)	426 (67.6)	205 (78.2)	1,288 (67.8)	3,141 (68.4)
Three	454 (25.2)	159 (25.2)	43 (16.4)	490 (25.8)	1,146 (24.9)
Four or more	62 (3.4)	11 (1.8)	4 (1.5)	45 (2.4)	122 (2.7)
p-value					<0.01*
Number of visits					
1	180 (10.0)	77 (12.2)	33 (12.6)	280 (14.7)	570 (12.4)
2–5	282 (15.7)	154 (24.4)	77 (29.4)	415 (21.8)	928 (20.2)
6–9	238 (13.2)	151 (24.0)	49 (18.7)	356 (18.7)	794 (17.3)
10–19	483 (26.8)	177 (28.1)	72 (27.5)	588 (30.9)	1,320 (28.7)
20+	619 (34.4)	71 (11.3)	31 (11.8)	262 (13.8)	983 (21.4)
p-value					<0.01*
Median number of visits over study period, (IQR)	13 (5–23)	8 (4–14)	7 (3–14)	8 (3–15)	10 (4–18)

Median number of visits / patient / year, (IQR)	12 (9 -15)	11 (9 – 14)	12 (9 – 17)	11 (10 – 14)	N/A

***** Indicates statistically significant findings ($p < 0.05$) on chi-square testing across groups

Figure 6.2: Availability of clinics for non-communicable diseases for Syrian refugees in the Bekaa Valley as of October 2016

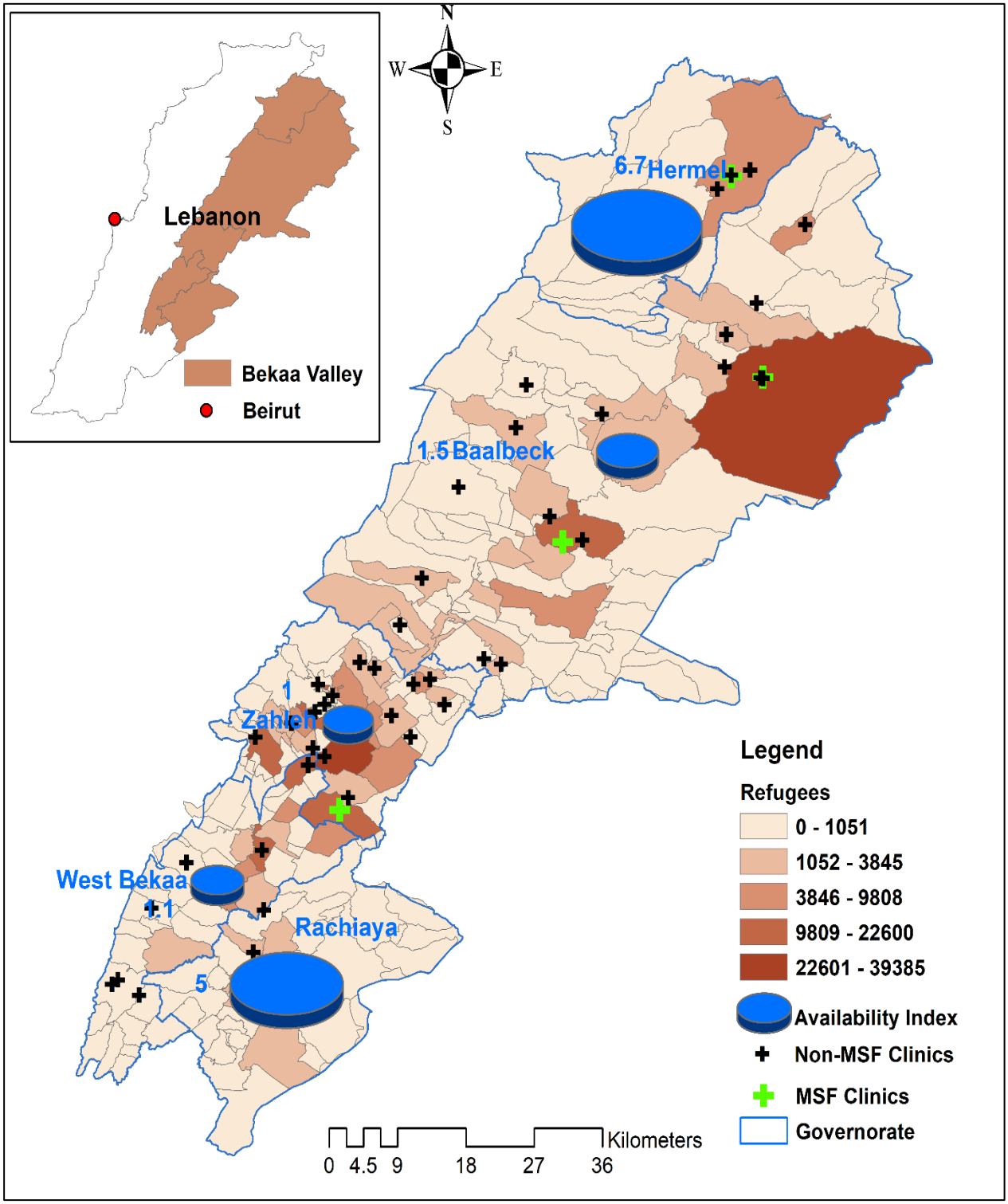
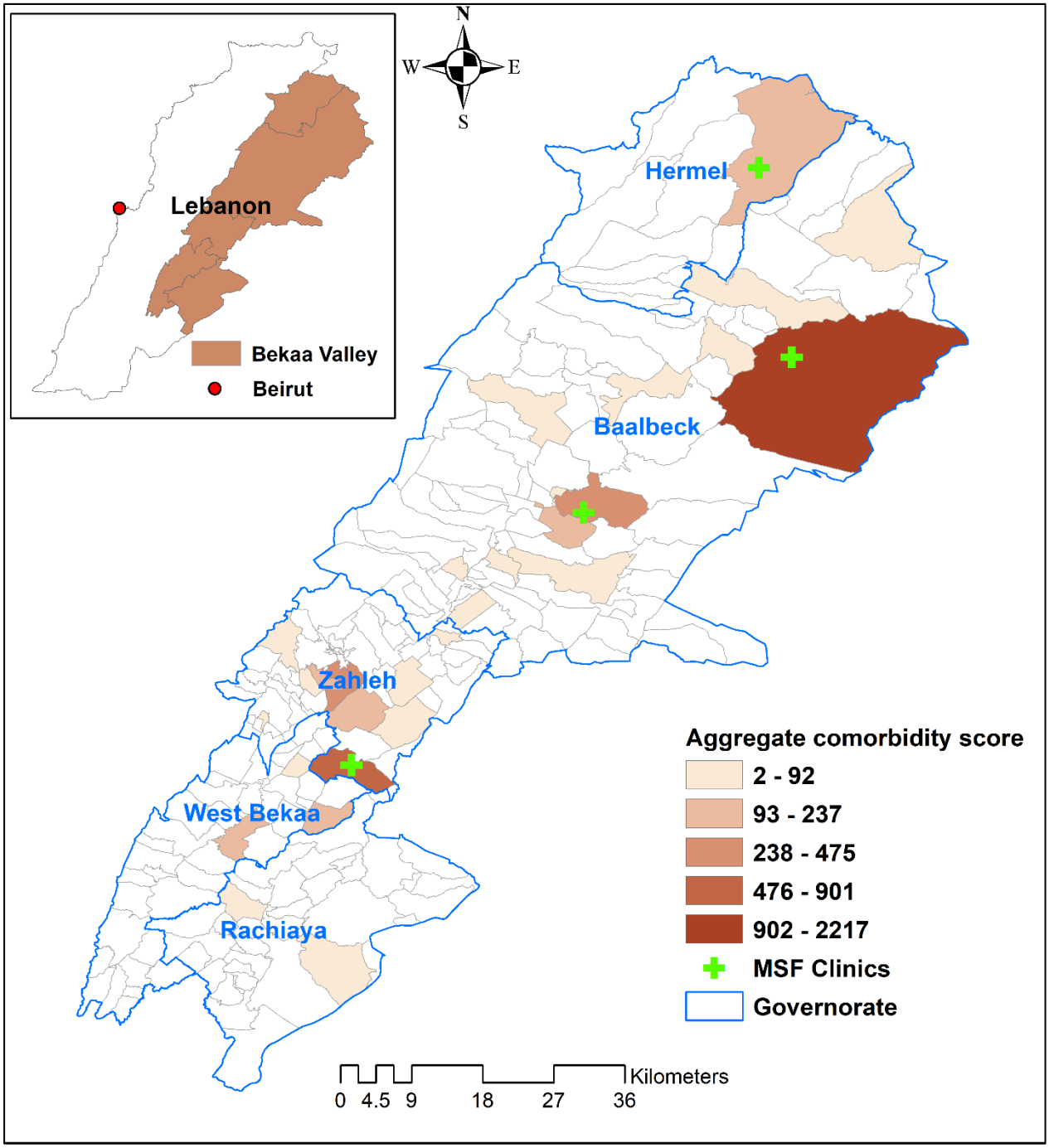


Table 6.2: Types of non-communicable diseases seen at Médecins sans Frontières primary health care clinics in the Bekaa valley between 1 January 2014 and 23 August 2016

	Arsal N (%)	Baalbeck N (%)	Hermel N (%)	Majdal Anjar N (%)	p-value *	Total N (%)
Total diagnoses	2316	777	303	2407	-	5803
Hypertension	1012 (56.2)	339 (53.8)	123 (46.9)	1080 (56.8)	**0.02**	2554 (55.6)
Type 2 diabetes mellitus	657 (36.5)	239 (37.9)	87 (33.2)	747 (39.3)	0.14	1730 (37.6)
COPD & Asthma	62 (3.4)	64 (10.2)	26 (9.9)	246 (12.9)	**<0.01**	398 (8.7)
Cardiovascular disease	237 (13.2)	38 (6.0)	27 (10.3)	59 (3.1)	**<0.01**	361 (7.9)
Hypothyroidism	141 (7.8)	41 (6.5)	22 (8.4)	107 (5.6)	**0.04**	311 (6.8)
Epilepsy	142 (7.9)	35 (5.6)	13 (5.0)	113 (5.9)	**0.04**	303 (6.6)
Type 1 diabetes mellitus	29 (1.6)	11 (1.7)	5 (1.9)	50 (2.6)	0.16	95 (2.1)
Pregnancy induced hypertension	16 (0.9)	10 (1.6)	0	5 (0.3)	**<0.01**	31 (0.7)
Heart failure	20 (1.1)	0	0	0	**<0.01**	20 (0.4)

***** Compares diagnosis versus no diagnosis across clinics for each condition. Bolded figures indicate a statistically significant finding (p-value <0.05).

Figure 6.3: Aggregated co-morbidity scores for patients presenting to Médecins sans Frontières clinics in the Bekaa valley between 1 Jan 2014 and 23 Aug 2016



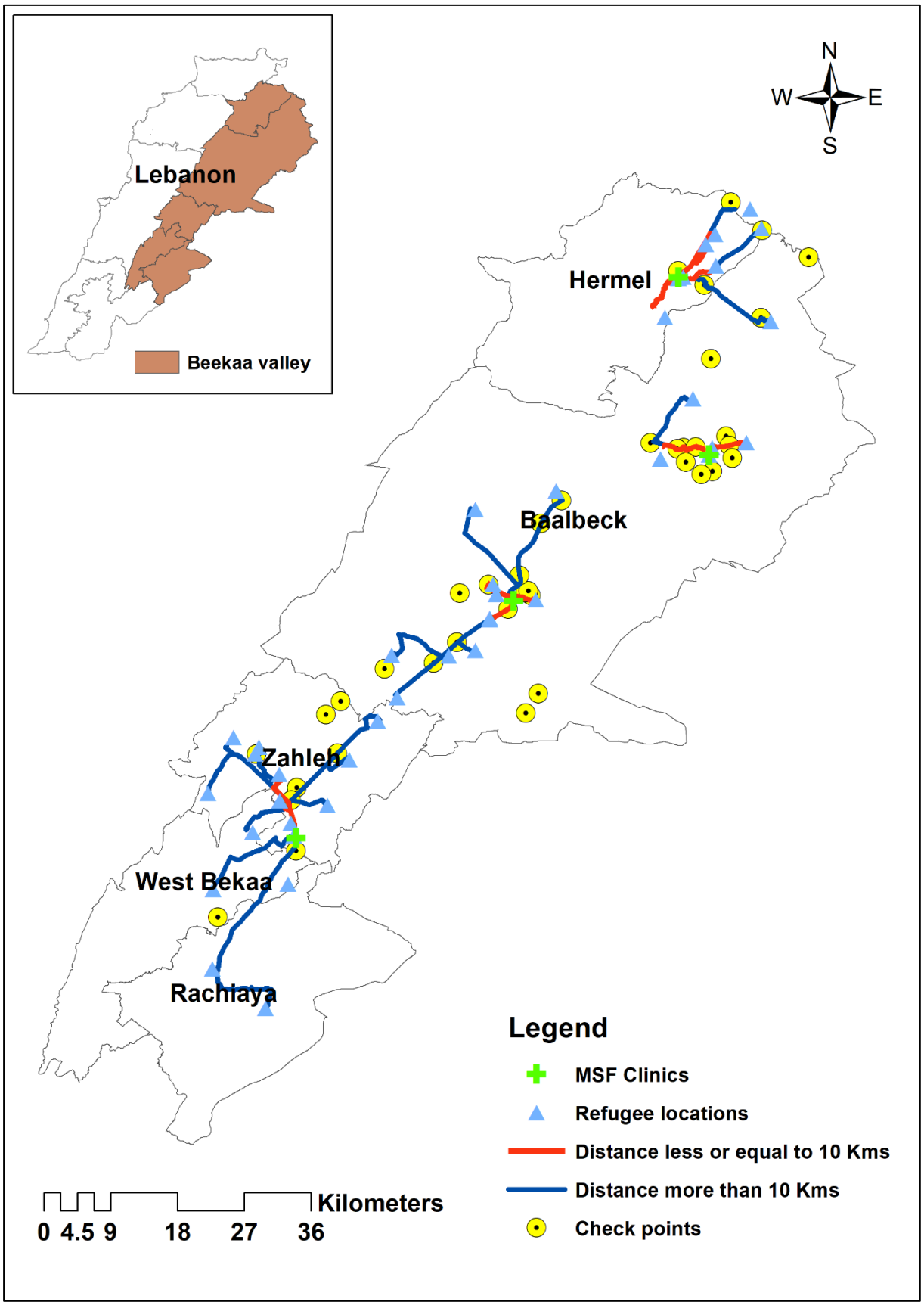
The results of network analysis calculating the travel distance from refugee locations to the nearest MSF clinics on road networks are shown in Figure 6.4. Approximately 70% of patients lived within five kilometres of the clinic (Table 6.3). However, this varied between clinics. At Arsal and Baalbeck clinics, 92% and 83% of patients respectively, came from within five kilometres of the clinic, while at Majdal Anjar, less than half of patients (45%) attending this clinic lived with five kilometres. At Majdal Anjar and Hermel clinics, approximately 30% of patients travelled more than 10 kilometres to come to an MSF clinic. The median distance travelled to Majdal Anjar clinic was 14.5 kilometres with some patients travelling from more than 30 kilometres away.

Military and police checkpoints as of October 2016 are also modelled in Figure 6.4. This shows a higher proportion of checkpoints in the northern governorates of Baalbeck and Hermel, particularly in the town of Arsal, compared to the southern Bekaa valley. There was no significant difference (p-value > 0.05) in travel distance before and after modelling checkpoints as a barrier in the network analysis.

Table 6.3: Travel distance on road networks from refugee locations to the nearest Médecins sans Frontières clinic in the Bekaa valley, 2014–2016

	Arsal	Baalbeck	Hermel	Majdal Anjar	Total
Total patients	1802	630	262	1901	4595
Travel distance, kms					
0 – <5	1,654 (91.8)	520 (82.5)	146 (55.7)	849 (44.7)	3,169 (69.0)
> 5 – <10	148 (8.2)	1 (0.2)	34 (13.0)	467 (24.6)	650 (14.2)
> 10 – <15	0	43 (6.8)	73 (27.9)	291 (15.3)	407 (8.9)
> 15	0	66 (10.5)	9 (3.4)	294 (15.5)	369 (8.0)
Median travel distance (range), kms	7.8 (0–24.2)	5.9 (0.1–14.3)	11.2 (2.3–23.5)	14.5 (0.5–31.8)	N/A

Figure 6.4: Network analysis showing distance travelled from refugee locations to the nearest Médecins sans Frontières clinic using road networks in the Bekaa valley, Lebanon, 2014 - 2016



Characteristics of patients who attended more than 10 visits

The median number of visits made to an MSF clinic by patients analysed in this study was 10. Results of univariable and multivariable logistic regression analysis of predictors of NCD patients visiting an MSF clinic more than 10 times are presented in Table 6.4.

The clinic attended, age group, male gender, distance to clinic and a diagnosis of CVD or type 1 diabetes mellitus were significantly associated with making more than ten visits to an MSF clinic for NCD care in both univariable and multivariable analysis. Patient with diagnoses of CVD or type 1 DM had greater odds of making more than ten visits, compared to other diagnoses. Diagnoses of hypertension, type 2 diabetes mellitus and COPD/Asthma were significant on univariable analysis but not on multivariable analysis. Males had 27% (CI: 56 – 88%) greater odds of making ten visits compared to females while 40 – 59 year olds had 78% (CI: 54 – 71%) greater odds of making 10 visits compared to patients less than 17 years of age.

The time spent in follow up was highly correlated with the number of visits made to a clinic – more than 65% of people who made 10 or more visits to a clinic were followed up for 18 months or longer. Similarly, approximately two-thirds of people who made less than 10 visits were in follow-up for five months or less.

Compared to Arsal clinic, the odds of patients making more than 10 visits at Baalbeck, Hermel and Majdal Anjar were 54% (CI: 55 – 62%), 52% (CI: 36 – 64%) and 67% (CI: 27 – 56%) lower, respectively. There was an inverse relationship between travel distance to a clinic and making more than ten visits: the further away patients lived from a clinic, the lower the odds of making ten visits or more. Compared to those who lived within five kilometres travel distance to a clinic, those who lived between five and 10 kilometres away had 18% (CI: 1 – 31%) lower odds, those who lived between 10 and 15 kilometres travel distance away had 21% (CI: 1 – 37%) lower odds and those who lived more than 15 kilometres travel distance away had 48% (CI: 33 – 59%) lower odds of making more than 10 visits.

Table 6.4: Characteristics of patients making more than 10 visits to Médecins sans Frontières primary health care clinics, Bekaa valley, Lebanon, 2014 – 2016 *

	< 10 visits (N = 2,292)	≥ 10 visits (N = 2,303)	p-value **	Odds of making 10 or more visits	
	N (%)	N (%)		Crude OR (95% CI)	Adjusted OR (95% CI)
Clinic					
Arsal	700 (30.5)	1,102 (47.9)	**<0.01**	Ref	Ref
Baalbeck	382 (16.7)	248 (10.8)		**0.41 (0.34–0.50)**	**0.46 (0.38–0.55)**
Hermel	159 (6.9)	103 (4.5)		**0.41 (0.32–0.54)**	**0.48 (0.36–0.64)**
Majdal Anjar	1,051 (45.9)	850 (36.9)		**0.51 (0.45–0.59)**	**0.63 (0.54–0.73)**
Age					
0–17 years	184 (8.0)	119 (5.2)	**<0.01**	Ref	Ref
18–39 years	366 (16.0)	286 (12.4)		1.21 (0.92–1.60)	1.24 (0.91–1.69)
40–59 years	1,042 (45.5)	1,218 (52.9)		**1.81 (1.41–2.31)**	**1.78 (1.29–2.46)**
60+ years	694 (30.3)	672 (29.2)		**1.50 (1.16–1.93)**	1.34 (0.96–1.88)
Missing	6 (0.3)	8 (0.4)		--	--
Gender					
Female	1,380 (60.2)	1,263 (54.8)	**<0.01**	Ref	Ref
Male	912 (39.8)	1,040 (45.2)		**1.25 (1.11–1.40)**	**1.27 (1.12–1.44)**
Time in follow up					
< 5 months	1, 554 (67.8)	5 (0.2)	**<0.01**		--
6-11 months	567 (24.7)	262 (11.4)			
12-17 months	118 (5.2)	528 (22.9)			
18+ months	53 (2.3)	1,508 (65.5)			

	< 10 visits (N = 2,292)	≥ 10 visits (N = 2,303)	p-value **	Odds of making 10 or more visits	
	N (%)	N (%)		Crude OR (95% CI)	Adjusted OR (95% CI)
Number of morbidities					
One	97 (4.2)	89 (3.9)	**<0.01**	One	97 (4.2)
Two	1,673 (73.0)	1,468 (63.7)		Two	1,673 (73.0)
Three	477 (20.8)	669 (29.1)		Three	477 (20.8)
Four or more	45 (2.0)	77 (3.3)		**1.86 (1.17–2.97)**	1.04 (0.47–2.34)
Distance to clinic, kms					
< 5	1,464 (63.9)	1,705 (74.0)	**<0.01**	Ref	Ref
≥ 5 – < 10	345 (15.1)	305 (13.2)		**0.76 (0.64–0.90)**	**0.82 (0.69–0.99)**
≥ 10 – < 15	238 (10.4)	169 (7.3)		**0.61 (0.49–0.75)**	**0.79 (0.63–0.99)**
≥ 15	245 (10.7)	124 (5.4)		**0.43 (0.35–0.55)**	**0.52 (0.41–0.67)**
Diagnoses * **					
Hypertension	1,203 (52.5)	1,351 (58.7)	**<0.01**	**1.29 (1.14–1.44)**	1.12 (0.87–1.46)
Type 2 Diabetes Mellitus	795 (34.7)	935 (40.6)	**<0.01**	**1.29 (1.14–1.45)**	1.16 (0.90–1.50)
Cardiovascular disease	125 (5.5)	236 (10.3)	**<0.01**	**1.98 (1.58–2.48)**	**1.50 (1.08–2.08)**
Hypothyroidism	168 (7.3)	143 (6.2)	0.13	0.84 (0.66–1.05)	--
COPD/Asthma	246 (10.7)	152 (6.6)	**<0.01**	**0.59 (0.48–0.73)**	0.83 (0.61–1.13)
Epilepsy	167 (7.3)	136 (5.9)	0.06	0.80 (0.63–1.01)	1.21 (0.85–1.71)
Type 1 Diabetes Mellitus	36 (1.6)	59 (2.6)	**0.02**	**1.65 (1.08–2.50)**	**2.95 (1.79–4.84)**

* Bolded numbers indicate statistically significant ($p < 0.05$) findings on chi-square testing and regression analysis

** p-values refers to chi-square tests

*** Analysed as dichotomous variables – (diagnosis vs no diagnosis)

6.5 Discussion

In this chapter, I explore the concept of primary health care access as it relates to a cohort of patients with non-communicable diseases who sought care at four MSF PHC clinics in the Bekaa valley between 2014 and 2016. From my analysis, I found that the availability of PHCCs for NCD services were not in proportion to the distribution of Syrian refugees in the Bekaa valley or their level of medical morbidity. I found that most patients lived within five kilometres travel distance of an MSF clinic, however, in the towns of Hermel and Majdal Anjar, over 30% of patients travelled more than 10 kilometres. Finally, I found that among other factors, the further patients lived away from the clinic, the lower the odds of them making more than 10 visits to an MSF clinic.

In intervening in the Bekaa valley in 2012, MSF's strategy took into account the areas of highest refugee density, the presence of other humanitarian actors and considered where MSF could have added value (281). At least some of these assumptions have been validated by this study. The majority of patients came from two clinics - Majdal Anjar and Arsal, two towns which also host the highest number of Syrian refugees in the Bekaa valley. These towns also had patients with the highest number of cumulative comorbidities, as measured by the aggregate comorbidity score, and they were located in the two governorates with the lowest overall availability indices – 1.5 per 10,000 in Baalbeck governorate (containing the town of Arsal) and 1 per 10,000 in Zahle governorate (containing the town of Majdal Anjar). These figures highlight the clear requirement for health services in this highly populated region of the Bekaa valley where health care needs are greatest. In planning for PHC service delivery in humanitarian settings, international humanitarian actors should take into account such factors as: areas of high refugee/displaced population density, presence of other actors providing the service in a specified geographic area and unique characteristics of the population which may indicate a greater need for a particular service.

The Sphere guidelines suggest that there should be one healthcare facility for 10,000 people (33). The guidelines also acknowledge that available healthcare facilities may be varied and include secondary healthcare facilities, especially in urban areas. It should be noted here that this standard refers to access for general health care and is not specific for those with chronic diseases. It is important to consider three main factors with respect to the availability of PHCCs for NCD services as described in this study. Firstly, the data presented here represent only a snapshot of available clinics in the Bekaa valley at one point in time (October 2016). While few have published specifically on the humanitarian health response in the Bekaa valley, there are numerous informal reports of the fluctuant response of national and international NGOs in Lebanon, many of whom are affected by shortages in funding as they deal with the scale and persistence of the refugee crisis in Lebanon

(282-285). Essentially, this means that the availability of health services for refugees is dynamic, uncertain and in constant flux. The availability indices may have been higher or lower at different points in time. The second factor to consider is that I have not taken into account secondary healthcare facilities, pharmacies or mobile clinics which may also be available to Syrian refugees seeking care for NCDs. However, it is unlikely that Syrian refugees would seek routine care for chronic diseases at secondary healthcare facilities due to cost. Surveys conducted in Lebanon have shown that Syrian refugees preferentially seek care at PHCCs (252, 253, 286). Thirdly, while I have considered the availability of facility infrastructure, this has not taken into account the availability of *effective* PHC services. The PHCPI define availability of effective PHC services as: the availability of health service providers who are competent, motivated, develop a sense of respect and trust with the patient and are clinically safe (71). It also has to include the availability of adequate drugs and supplies in sufficient quantity at the clinic level. Information shared between the health cluster in Lebanon suggests that only half the number of available clinics are stocked with essential drugs (MSF internal reports). This is verified by reports of MSF clinic staff who hear frequently from patients about drug ruptures at other PHCCs. It is possible therefore that this could apply to governorates such as Hermel and Rachaiya, which have a high number of available clinics per 10,000 population. However, the availability of effective PHC services is unclear.

The four MSF clinics are geographically spread throughout the Bekaa valley and the unique geopolitical situation at each site has implications for geographical access for patients. The clinic at Arsal is located in an area of high security as evidenced by the high concentration of military checkpoints in this town. Although it is an unintended consequence, the restriction in movement caused by this high security context has meant that the MSF clinic in Arsal has been relatively geographically accessible for patients. At Arsal clinic, more than 90% of patients travel from within five kilometres of the clinic – the most geographically accessible clinic of the four MSF clinics in the Bekaa valley. While there is no recommended standard for geographic distance to a clinic in humanitarian settings, the Sphere guidelines suggest that a minimum of 80% of the population should be able to access PHC within one hour's walk from dwellings (61). Assuming that the average walking speed of an adult is about five kilometres per hour (287), Arsal clinic is well within meeting this standard. This is a particularly important consideration for older patients, especially for the nearly 30% presenting to Arsal clinic who were 60 years or older, who may be more frail and/or have mobility restrictions.

In contrast to Arsal, the clinic at Majdal Anjar, had the most geographically widespread catchment population with patients attending from three governorates – Zahle, West Bekaa and Rachaiya. This likely reflects the increased freedom of movement and less security measures in place compared to

northern Bekaa. There were relatively fewer check points in place on the roads leading to this clinic. Less than half of all patients presenting to Majdal Anjar clinic came from within five kilometres travel distance; approximately 30% came from more than 10 kilometres away, with some even traveling more than 30 kilometres. This does hold significance for patients with chronic disease, particularly those over 60 years of age with multiple morbidities. Almost all patients (96%) 60 years or over, had two or more morbidities (see Appendix 1, Table 1). The vast majority of patients (78%) aged over 60 years who lived more than five kilometres from a clinic attended Majdal Anjar clinic (see Appendix 1, Table 2). This means that elderly patients with multi-morbidities were choosing to travel further to attend an MSF clinic, including from areas with a high availability index. In addition to the inconvenience of traveling far to a clinic, there is the cost of transportation to bear, in an age group which is typically not in employment. A significant burden is placed on this elderly population in seeking care for their NCDs in this part of the Bekaa valley.

Qualitative studies should be undertaken to explore the reasons people chose to attend MSF clinics over others which may have been more geographically accessible. However, a possible explanation for this is that MSF is the only humanitarian agency in the Bekaa valley that provides completely free care, including for the cost of medications for all those who attend. While there are other PHC actors that provide NCD services in the Bekaa valley, there is a minimum financial cost associated with all of them. For an example, the other main provider of NCD services in the Bekaa valley - YMCA, charges 18,000 LBP (approximately $12 USD) to register at their clinic and 1,000 LBP per medication (this cost is capped at five medications). These costs are significant for Syrian refugees who receive minimal financial assistance from UNHCR and who have little opportunity for employment (288). Refugees in the Bekaa valley are predominantly low-income, skilled and unskilled labourers and agricultural workers, compared to refugees in other parts of Lebanon (286, 289). Surveys among Syrian refugees in Lebanon demonstrate that they are under considerable financial stress (253, 290). The average expenditure on health for a refugee household in Lebanon is US$90 per month (286, 290) and among refugees receiving care for a chronic condition, 70% had an out of pocket payment for their most recent care received (9). An inability to afford medications is also the most commonly reported reason that Syrian refugees with chronic conditions report for stopping medications (71% of respondents) (289). As international aid to the Syrian crisis falls short of needs (244), there becomes an even greater requirement for service providers to provide affordable health care for refugees. This is even more so for those with chronic conditions where the consequences of unaffordable medications, poor adherence to treatment regimes or delayed care-seeking at health facilities may lead to complications and adverse health-related outcomes.

Factors that significantly affected patients attending a clinic on 10 or more occasions were the clinic attended, being in the 40 to 59 year old age group, being male, having a diagnosis of CVD or type 1 DM and distance to clinic. It is possible that those in the age group 40 to 59, who represented the majority of those with chronic diseases in this study population, were also those who were able to travel easier to the clinic, either by foot or be able to afford the cost of transportation, compared to those under 17 years and over 60 years of age. It is possible that these reasons also apply to males allowing them to make more visits than females, while females may have more household responsibilities. Those with a diagnosis of CVD or type 1 DM have greater odds of making more visits perhaps because they have been educated on the seriousness of their conditions and the need for ongoing monitoring or perhaps due to exacerbations of illness. Distance to clinic was a significant factor in making more than 10 visits - the further away patients lived from the clinic, the lower the odds of making more than 10 visits. This finding does have implications for vulnerable pockets of the population, such as the elderly (as explained earlier with the example of Majdal Anjar clinic) or those who are struggling financially to access affordable care for their chronic diseases.

Access is an important concept in primary health care and in health services research. In humanitarian emergency settings, full and unimpeded *humanitarian access* is a precondition for effective humanitarian assistance (140, 141). Despite its importance, humanitarian access has been viewed by many humanitarian agencies as the most significant current challenge for humanitarian action to overcome in the future (140). The changing nature of armed conflicts (being more fragmented, complex and non-international than previously), the perception that humanitarian activities maybe a threat to sovereignty, and the increasing number of humanitarian actors involved in emergencies today mean that more coordination and negotiation of humanitarian access is required (140). The ability of international health actors therefore, to provide appropriate services proportionate to the needs of refugees or internally displaced persons depends first on gaining *humanitarian access* to that population. When considering primary health care access in humanitarian emergencies then, the notion of humanitarian access has to be considered, in addition to the more well-known elements of access.

The two-pronged concept of humanitarian access can be applied to this case study. From the perspective of MSF as a service provider in reaching the population in need, humanitarian access relates to gaining access to the town of Arsal. As this was held as an enclave for much of the study period with numerous military and police checkpoints within the town parameters, access needed to be negotiated with the local authorities for MSF staff members to get into and out of the town to operate the Arsal clinic. Humanitarian access as it relates to the perspective of consumers and communities having the opportunity to use appropriate health services can also be seen in Arsal.

Residents of Arsal were restricted to the available services within their township. This had an impact on the host population as well as the refugee population. Compared to the other MSF clinics, Arsal clinic was the only one to receive Lebanese patients. The relative lack of facilities in this town compared to the other MSF clinic locations and the restriction in movement affected the local Lebanese population as well as the refugee population. The other way that humanitarian access can be viewed in this study is from the modelling of the numerous checkpoints that prevailed throughout the road networks of the Bekaa valley between 2014 and 2016, and exists to date. In our study, we modelled the impact of checkpoints as a barrier to travel distance and found no difference in travel distance with or without a checkpoint. However, we were not able consider other aspects such as travel time, registration status, age, gender, socioeconomic status and other factors. Any of these factors could be important for Syrian refugees, who themselves have to negotiate these checkpoints in order to access areas of the Bekaa valley outside their usual place of residence.

While this study presents important considerations on PHC access in humanitarian settings, there are limitations to the analysis. This analysis was based on a group of patients seeking care at four MSF clinics in the Bekaa valley. This group may not be representative of the wider Syrian refugee population seeking care for NCDs in the Bekaa valley or in other parts of Lebanon. There may also have been selection bias in analysing data from only patients with complete information on the place of residence. The data analysed in this study was routinely collected programmatic data, which meant that I could only consider available variables for analysis. There may have been other factors affecting accessibility such as acceptability of services, affordability or appropriateness of services that may have had an impact on patients accessing MSF services. In the network analysis, the distance travelled from patient dwelling to an MSF clinic was based on the shortest auto-generated distance on ArcGIS. It is possible that some patients travelled to MSF clinics that were not closest to them. This was not adjusted for in the analysis. Although most major checkpoints have fixed locations along the road network of the Bekaa valley, some may have changed over time. This was not accounted for in the analysis.

Despite these limitations, there are several important take-away messages for international humanitarian agencies when considering PHC access and service delivery in humanitarian settings. Primary health care clinics should be established in areas of high refugee/displaced population density where there may be a gap in service provision. Aligned closely with this is a consideration of the location of vulnerable populations – such as those over 60 years of age, those with multiple morbidities and/or those with specific medical needs. In assessing the availability of PHC, it is important to consider the availability of effective PHC services; an understanding of the availability

of adequate drugs, supplies and health workforce is as important as the number of buildings available. All these factors are affected by humanitarian access and the ability of patients and providers to reach each other in highly insecure circumstances. This is an ongoing challenge that requires the cooperation and commitment of state and non-state actors in order to provide effective humanitarian assistance for displaced and vulnerable populations.

Chapter 7 Priority-setting and continuity of care for Syrian refugees with NCDs in the Bekaa valley

7.1 Preamble

This chapter continues from the previous one looking at Syrian refugees accessing care for NCDs at four MSF PHC clinics in the Bekaa valley. The focus of this chapter is on the concept of 'adjustment to population health needs' (a 'System' level factor in the PHCPI) and 'continuity of care' – another important concept in PHC service delivery. There is overlap with the previous chapter in some parts, and this is indicated where relevant.

As the scoping review identified, even as international actors aimed to provide comprehensive PHC during the emergency response phase, there was a prioritisation of services towards the major morbidities faced in the different settings. The review found that in countries where the major causes of illness are from infectious diseases, such as in Sub-Saharan Africa, services were prioritised towards maternal and child health care and the management of infectious diseases, in addition to specific healthcare needs related to the disaster. In middle-Eastern countries, the review found a prioritisation of services towards the treatment and management of NCDs. It is this idea of 'adjustment to population health needs' that will be considered in this chapter.

As described in Chapter 5, closely linked to the management of NCDs is the requirement to monitor patients on an ongoing basis. The need for close follow-up and monitoring of a NCD patient's condition falls well within the concept of continuity of care. This is an essential concept in primary care. Continuity of care refers to a pattern of ongoing health care interaction that occurs in the same place, with the same medical record and with the same professional to foster a growing knowledge of the patient and the care-provider (73, 74). This concept will be assessed further in the setting of Syrian refugees seeking care for NCDs at four MSF PHC clinics in the Bekaa valley.

7.2 Introduction

Prior to the Syrian conflict in 2011, Syria was in its epidemiological transition from communicable to non-communicable diseases (291). Syria's Ministry of Health in 2010 was in the early stages of grappling with the scale and rapid increase of NCDs in the country (291). Estimates in 2011 suggested that NCDs accounted for approximately 77% of all deaths in the country (292). The first official recognition of the NCD challenge had only come in the government's Five Year Plan in 2006, where the State Planning Commission wanted to "reduce by a third the prevalence of the three main

risk factors – smoking, obesity and malnutrition" (291). However, WHO's profile on NCDs in Syria in 2014, suggests that Syria was far from realising this plan and being able to achieve the global NCD targets set at the 2014 World Health Assembly (293).

It is unsurprising then, that many refugees in Lebanon have serious health care needs due to pre-existing chronic conditions, amongst other health needs (286). According to a household survey conducted in 2015 amongst Syrian refugees in Lebanon, 50% of households reported the presence of hypertension, cardiovascular disease, diabetes, chronic respiratory disease or arthritis in one or more household member (252). The most prevalent conditions reported were hypertension (40%) and type 2 diabetes mellitus (28%) (252).

The management of individuals with NCDs is challenging, even in highly-resourced, high-income settings (258). Management requires detection, screening, treatment and ongoing monitoring of the condition so as to limit progression of disease and prevent complications (263). Depending on the type of NCD, patients may be required to be on more than one medication, particularly those with cardiovascular diseases (294). For conditions such as type 1 diabetes mellitus, there is a requirement to be on injectable insulin life-long, and for some patients with type 2 diabetes mellitus, this may also be the case (295). There is often a need to conduct laboratory tests to diagnose and monitor disease status (263, 295). People with NCDs may have exacerbations of their condition, such as those with asthma, or they may have further complications, as with type 2 DM and hypertension (294, 295). In these instances, patients often need to be referred to specialist services and/or require hospitalisation for ongoing management. In light of these factors, it is highly recommended that people diagnosed with NCDs have regular follow-up at the primary health care level (263).

The concept of continuity of care is an essential one to primary care (92). It is associated with increased patient satisfaction and quality of life, and improved health outcomes (296-298). Haggerty and colleagues have described three essential components of continuity of care. These are relational continuity, management continuity and informational continuity (299). Relational (also referred as interpersonal) continuity is defined as an ongoing relationship between a patient and the same provider where the relationship between patients and providers are strengthened through mutual familiarity and personal trust (297, 299). Informational continuity is the use of information on past events and personal circumstances to make current care appropriate for each individual (299). Management continuity is a collaboration between providers to ensure services are delivered consistently and coherently (299).

Continuity of care requires both the care of an individual and the proper management of care linked over time (300). This aspect is considered particularly important for patients with chronic diseases who require long-term, ongoing contact with a medical professional at the PHC level, rather than sporadic or episodic contact (301). Regular follow-up with a general practitioner at the PHC level for conditions such as diabetes, heart failure and asthma has the potential to delay or even prevent the onset of disease-related complications, and reduce potentially preventable hospitalisations (301-304).

In the Bekaa valley, MSF clinics are the main provider of completely free services at the PHC level in the Bekaa valley, Syrian refugees and others in the Bekaa valley, are at liberty to visit any PHC clinic they wish and can visit multiple clinics simultaneously. This study reports on individuals with NCDs presenting for care at four MSF clinics located throughout the Bekaa valley in Lebanon. These MSF clinics have an integrated primary care model, treating patients for acute and chronic conditions. Although there are permanent, contracted general practitioners working at each MSF clinic, NCD patients were not necessarily followed up by the same GP on each visit. They may be seen by any of the GPs in the clinic. It is the aspect of relational continuity with an MSF clinic that is considered in this study. The aims of this study are firstly, to describe the characteristics of NCD patients who presented for care at these clinics between 1 January 2013 and 26 November 2016 and secondly, to understand the characteristics of patients already in care for one year who continued to stay in care for longer than one year.

7.3 Methods

7.3.1 Study design and study population:

This is a retrospective, descriptive study of all patients who were diagnosed with a non-communicable disease and were entered onto the MSF chronic disease database between 1 January 2013 and 26 November 2016 at any of the four MSF clinics in the Bekaa Valley (Arsal, Baalbek, Hermel and Majdal Anjar). Non-communicable diseases classified in the database include: hypertension, type 1 diabetes mellitus, type 2 diabetes mellitus, cardiovascular disease (includes angina, myocardial infarction and cerebrovascular accident), chronic obstructive pulmonary disease (COPD), asthma, epilepsy and hypothyroidism. In this analysis, I did not include the conditions: pregnancy-induced hypertension, gestational diabetes and heart failure.

7.3.2 Data sources

Data were retrieved from the electronic health information system that captured patient-specific data. Trained personnel retrospectively record NCD program data extracted from paper-based medical patients' files in a standardised fashion into the health information system. Depending on the clinic, data are entered on a daily or weekly basis. Variables recorded include: socio-demographic characteristics - age, gender, nationality, UNHCR registration status, clinical characteristics - diagnosis, medications prescribed, referrals made for laboratory investigation or specialist care, synthesis of the patient's condition, and programmatic variables such as year enrolled in the program and dates of follow-up. Table 7.1 shows the criteria for a 'new' diagnosis of a NCD made at an MSF clinic based on MSF guidelines. While hypertension is not a diagnosis in itself, at these clinics, it is registered as a separate condition.

Table 7.1: Criteria for newly diagnosing a condition at Médecins sans Frontières primary health care clinics in the Bekaa valley, 2016

Disease	Diagnostic Criteria
Type 2 diabetes mellitus	Two positive tests of HbA1c ≥ 6.5% or random blood glucose ≥ 11.1 mmol/L or fasting blood glucose of 7.0 mmol/L
Hypertension	Blood pressure ≥ 140/90 in at least three visits in a period of three months
Asthma	Symptoms of variable and intermittent airway obstruction
Chronic Obstructive Pulmonary Disease (COPD)	Symptoms compatible with COPD. If possible, diagnosis should be confirmed by spirometry showing airflow limitation
Epilepsy	History of recurrent, unprovoked seizures
Hypothyroidism	Raised thyroid stimulating hormone (TSH) at two time intervals
Cardiovascular disease	History of cerebrovascular accident/stroke, myocardial infarction or angina

7.3.3 Data Analysis:

I described socio-demographic and health-related variables for the study population by clinic and by diagnosis. Variables analysed include: socio-demographic characteristics - age, gender, nationality, UNHCR registration status, and program and clinical variables at first visit - year enrolled in the program, clinical diagnosis (previously or newly diagnosed disease), total number of NCD medications prescribed, follow-up time in the program and number of visits made. To investigate the characteristics of patients retained in care for more than one year, I conducted sub-group

analysis on those who were already in care for at least 12 months. In the sub-group analysis, I used chi-squared tests and logistic regression to assess differences in characteristics of people staying in care for more than one year. A p-value <0.05 was considered statistically significant and confidence intervals were used. In multivariable analysis, variables were adjusted for age and sex and then variables with a p-value less than 0.1 on univariate analysis were added to the full model. All data were cleaned and analysed using Stata version 14 (College Station, TX).

7.3.4 Ethical approval

This study involved the analysis of routinely collected MSF programmatic data. The MSF Ethical Review Board has given prior approval for analysis of routinely collected data. Therefore, there was no requirement to obtain formal MSF ethical review. However, I did obtain approval for the retrospective analysis of this routinely collected data from MSF Switzerland headquarters. Ethical approval was not sought from Lebanese authorities as this analysis was considered a part of quality assurance activities within MSF. Ethical approval was granted by the Australian National University Human Research Ethics Committee, protocol number 2016/099.

7.4 Results

7.4.1 Characteristics of presenting patients by clinic

Between 1 January 2013 and 26 November 2016, there were 7, 947 NCD patients enrolled at the four MSF clinics in the Bekaa valley, with data available for analysis. This figure represents approximately 25 – 27% of the total number of patients presenting for medical care at these clinics between 2013 and 2016. Baseline socio-demographic characteristics of all patients are shown in Table 7.2.

Almost half of patients (47 – 50%) in each of the four clinics were between the ages of 40 and 59. Hermel clinic saw a greater proportion of patients aged less than 17 years compared with the other clinics, while the clinic at Baalbek saw a greater proportion aged over 60 years.

As described in the previous chapter, females made up close to 60% of the total patient population and almost all (93 - 99%) patients in each clinic were of Syrian ethnicity. Of the Syrians, rates of registration with UNHCR were highest in the clinic in Arsal (79.8%) and lowest in Baalbeck (54.6%). There were differences in the number of presentations by year; in Arsal and Hermel, 41% of the total patients enrolled in 2014, while Baalbeck and Majdal Anjar had fluctuating but a steady flow of patients each year.

A finding of hypertension was the most common, seen in 47 – 57% of presenting patients at all clinics, followed by type 2 diabetes mellitus (34 – 39% of patients) and cardiovascular disease (7 – 12% of patients). Follow-up time in the program was lowest at the clinic at Baalbeck with a median time of four months, followed by Hermel and Majdal Anjar at six months while the clinic at Arsal saw patients staying in care for a median of 14 months.

Table 7.2: Baseline characteristics of patients registered with a non-communicable disease at a Médecins sans Frontières clinic in the Bekaa valley, January 2013–November 2016

	Arsal 2773 patients N (%)	**Baalbeck 1670 patients N (%)**	**Hermel 449 patients N (%)**	**Majdal Anjar 3055 patients N (%)**	**Total 7947 patients N (%)**
Age					
0 – 17 years	149 (5.4)	81 (4.9)	41 (9.1)	197 (6.5)	468 (5.9)
18 – 39 years	349 (12.6)	200 (12.0)	72 (16.0)	368 (12.1)	989 (12.4)
40 – 59 years	1382 (49.8)	782 (46.8)	212 (47.2)	1460 (47.8)	3836 (48.3)
60 + years	881 (31.8)	571 (34.2)	121 (27.0)	932 (30.5)	2505 (31.5)
Missing	12 (0.4)	36 (2.2)	3 (0.7)	98 (3.2)	149 (1.9)
Gender					
Female	1584 (57.1)	1009 (60.4)	261 (58.1)	1803 (59.0)	4657 (58.6)
Male	1189 (42.9)	659 (39.5)	188 (41.9)	1250 (40.9)	3286 (41.4)
Missing	0	2 (0.1)	0	2 (0.1)	4 (0.1)
Year enrolled					
2013	529 (19.1)	622 (37.3)	75 (16.7)	428 (14.0)	1654 (20.8)
2014	1155 (41.7)	385 (23.1)	184 (41.0)	1012 (33.1)	2736 (34.4)
2015	530 (19.1)	263 (15.8)	110 (24.5)	922 (30.2)	1825 (23.0)
2016	559 (20.2)	400 (24.0)	80 (17.8)	693 (22.7)	1732 (21.8)
Ethnicity					
Syrian	2597 (93.7)	1646 (98.6)	446 (99.3)	3041 (99.5)	7730 (97.3)
Lebanese	141 (5.1)	5 (0.3)	1 (0.2)	0	147 (1.9)
Palestinian	0	12 (0.7)	0	1 (0.03)	13 (0.2)
Palestinian from Syria	0	0	0	2 (0.07)	2 (0.03)
Iraqi	0	0	1 (0.2)	0	1 (0.01)
Missing	6 (0.2)	6 (0.4)	1 (0.2)	11 (0.4)	24 (0.3)
No of Syrians registered with UNHCR (% of Syrians in clinic)	2073 (79.8)	898 (54.6)	319 (71.5)	2317 (76.2)	5607 (70.6)
Diagnoses					
Hypertension	1422 (51.3)	918 (55.0)	211 (47.0)	1732 (56.7)	4283 (53.9)

	Arsal 2773 patients N (%)	Baalbeck 1670 patients N (%)	Hermel 449 patients N (%)	Majdal Anjar 3055 patients N (%)	Total 7947 patients N (%)
Type 2 Diabetes Mellitus	953 (34.4)	646 (38.7)	151 (33.6)	1176 (38.5)	2926 (36.8)
Cardiovascular disease	295 (10.6)	163 (9.8)	52 (11.6)	206 (6.7)	716 (9.0)
Hypothyroidism	157 (5.7)	93 (5.6)	35 (7.8)	157 (5.1)	442 (5.6)
COPD/Asthma	83 (3.0)	165 (9.9)	35 (7.8)	334 (10.9)	617 (7.8)
Epilepsy	170 (6.1)	84 (5.0)	23 (5.1)	166 (5.4)	444 (5.6)
Type 1 Diabetes Mellitus	37 (1.3)	30 (1.8)	16 (3.6)	80 (2.6)	163 (2.1)
Median follow up time over study period, months (IQR)	14 (2–28)	4 (0–15)	6 (1–18)	6 (1–17)	7 (1–21)

7.4.2 Characteristics of presenting patients by diagnosis

Table 7.3 reports on the characteristics of presenting patients by clinical diagnosis. As expected, the majority of patients with a diagnosis of hypertension, T2DM and CVD were in the age group 40 – 59 years. Most patients with hypothyroidism and COPD/Asthma were also in this age range. Those with epilepsy were mostly under 17 years of age, while the majority of those presenting with T1DM were aged between 18 to 39 years.

Females made up the bulk of those with a diagnosis of hypertension, T2DM, hypothyroidism and COPD/Asthma while males were the majority of those with diagnoses of cardiovascular disease, epilepsy and T1DM.

Most patients with T2DM and cardiovascular disease had at least one other comorbidity, while the majority of patients with a diagnosis of hypothyroidism, COPD/Asthma, Epilepsy and T1DM had only this condition. Close to 20% of patients with a diagnosis of cardiovascular disease had three or more comorbidities. This finding corresponded with the number of prescribed medications that CVD patients were taking - more than half of all patients with CVD were on four or more medications. More than a third of patients with hypertension and T2DM were also on four or more medications.

For most conditions, except for COPD/Asthma, the median follow-up time in the program ranged from seven to nine months with large variation around this median of one to 25 months. Those with COPD/Asthma were followed up for approximately five months.

Between 20 – 25% of patients with a diagnosis other than T1DM came for only one visit. Across all diagnoses except CVD, most patients came for two to five visits. Approximately a third of patients with CVD came for over 20 visits.

7.4.3 Predictors of retention-in-care past one year

Results of univariable and multivariable logistic regression analysis for predictors of retention-in-care past one year for Syrian refugees with NCDs attending an MSF clinic in the Bekaa valley are presented in Table 7.4. These results refer to a sub-group of Syrian refugees with NCDs enrolled in an MSF clinic for at least 12 months.

The clinic attended, number of comorbidities and a diagnosis of cardiovascular disease and hypothyroidism were significantly associated with staying in care past one year in both univariable and multivariable analysis. A patient with a diagnosis of cardiovascular disease had greater odds of staying in care past one year, while a patient with a diagnosis of hypothyroidism had lower odds of staying in care past one year.

The odds of staying in care past six months for patients who attended Hermel and Majdal Anjar clinics were 39 – 49% lower, respectively, than those who attended Arsal clinic. Compared to patients who had no comorbidities, those who had one other comorbidity had 47% (CI: 33 – 58) lower odds of staying in care past one year.

Table 7.3: Characteristics of patients with NCDs presenting at MSF clinics in the Bekaa valley, Lebanon, 2013 - 2016

	Hypertension, 4283 diagnoses N (%)	Type 2 Diabetes Mellitus, 2926 diagnoses N (%)	Cardiovascular disease, 716 diagnoses N (%)	Hypothyroidism, 442 diagnoses N (%)	COPD/Asthma, 617 diagnoses N (%)	Epilepsy, 444 diagnoses N (%)	Type 1 Diabetes Mellitus, 163 diagnoses N (%)
Age group							
0 – 17 years	4 (0.1)	4 (0.1)	13 (1.8)	33 (7.5)	102 (16.5)	203 (45.8)	57 (35.0)
18 – 39 years	242 (5.7)	196 (6.7)	54 (7.5)	149 (33.7)	113 (18.3)	145 (32.7)	80 (49.1)
40 – 59 years	2290 (53.5)	1647 (56.3)	360 (50.3)	181 (41.0)	231 (37.4)	48 (10.8)	11 (6.8)
60+ years	1694 (39.6)	1043 (35.7)	284 (39.7)	67 (15.2)	157 (25.5)	29 (6.6)	7 (4.3)
Missing	53 (1.2)	36 (1.2)	5 (0.7)	12 (2.7)	14 (2.3)	19 (4.3)	8 (4.9)
Gender							
Male	1596 (37.3)	1213 (41.5)	402 (56.2)	65 (14.7)	277 (44.9)	253 (56.9)	92 (56.4)
Female	2687 (62.7)	1713 (58.5)	314 (43.9)	377 (85.3)	340 (55.1)	191 (43.1)	71 (43.6)
Number of comorbidities							
None	2235 (52.2)	1289 (44.1)	242 (33.8)	321 (72.6)	418 (67.8)	409 (92.1)	152 (93.3)
1 other	1837 (42.9)	1438 (49.2)	338 (47.2)	87 (19.7)	149 (24.2)	26 (5.9)	9 (5.5)
2 others	206 (4.8)	194 (6.6)	134 (18.7)	31 (7.0)	46 (7.5)	8 (1.8)	2 (1.2)
3 or more others	5 (0.1)	5 (0.2)	2 (0.3)	3 (0.7)	4 (0.7)	1 (0.2)	0
Number of prescribed medications							
0	24 (0.6)	17 (0.6)	4 (0.6)	9 (2.0)	6 (1.0)	16 (3.6)	0
1	958 (22.4)	547 (18.7)	52 (7.3)	296 (67.0)	140 (22.7)	353 (79.5)	106 (65.0)
2 - 3	1719 (40.1)	1282 (43.8)	241 (33.7)	84 (19.0)	362 (58.7)	62 (14.0)	52 (31.9)
>= 4	1582 (37.0)	1080 (36.9)	419 (58.5)	53 (12.0)	109 (17.7)	13 (2.9)	5 (3.1)

	Hypertension, 4283 diagnoses N (%)	Type 2 Diabetes Mellitus, 2926 diagnoses N (%)	Cardiovascular disease, 716 diagnoses N (%)	Hypothyroidism, 442 diagnoses N (%)	COPD/Asthma, 617 diagnoses N (%)	Epilepsy, 444 diagnoses N (%)	Type 1 Diabetes Mellitus, 163 diagnoses N (%)
Follow up time in program – months (median, IQR)	8 (1 – 22)	7 (1 – 21)	9 (1 – 25)	7 (1 – 18)	5 (0 – 17)	8 (1 – 21)	9 (2 – 23)
Number of visits							
1 visit	962 (22.5)	600 (20.5)	156 (21.8)	85 (19.2)	158 (25.6)	96 (21.6)	26 (16.0)
2 – 5 visits	986 (23.0)	716 (24.5)	159 (22.2)	126 (28.5)	184 (29.8)	108 (24.3)	34 (20.9)
6 – 9 visits	521 (12.2)	361 (12.3)	74 (10.3)	63 (14.3)	88 (14.3)	73 (16.4)	19 (11.7)
10 – 19 visits	868 (20.3)	594 (20.3)	121 (16.9)	101 (22.9)	115 (18.6)	104 (23.4)	32 (19.6)
20+ visits	946 (22.1)	654 (22.4)	206 (28.8)	67 (15.2)	72 (11.7)	63 (14.2)	52 (31.9)

Table 7.4: Characteristics of patients in care for at least one year who remained in care for 1 year or more at MSF clinics in the Bekaa Valley, Lebanon, 2013 - 2016*

	Stayed ≤ 1 year, N = 1, 545	Stayed for > 1 year N = 1, 668	p-value**	Odds of staying for > 1 year		
	N (%)	N (%)		Crude OR (95% CI)	Adjusted OR for Age and Gender ONLY (95% CI)	Adjusted OR (95% CI)
Clinic						
Arsal	602 (39.0)	882 (52.9)	**< 0.01**	Reference	Reference	Reference
Baalbeck	223 (14.4)	269 (16.1)		0.82 (0.67 – 1.01)	0.83 (0.67 – 1.02)	0.89 (0.72 – 1.10)
Hermel	92 (6.0)	73 (4.4)		**0.54 (0.39 – 0.75)**	**0.55 (0.39 – 0.75)**	**0.61 (0.44 – 0.85)**
Majdal Anjar	628 (40.7)	444 (26.6)		**0.48 (0.41 – 0.57)**	**0.49 (0.42 – 0.58)**	**0.51 (0.43 – 0.60)**
Age group						
0 – 17 years	88 (5.7)	78 (4.7)	**< 0.01**	Reference	N/A	Reference
18 – 39 years	192 (12.4)	197 (11.8)		1.16 (0.80 – 1.67)		1.08 (0.74 – 1.57)
40 – 59 years	761 (49.3)	937 (56.2)		1.39 (1.00 – 1.91)		1.16 (0.83 – 1.61)
60+ years	485 (31.4)	451 (27.0)		1.05 (0.75 – 1.46)		0.82 (0.58 – 1.15)
Missing	19 (1.2)	5 (0.3)				
Gender						
Female	867 (56.1)	964 (57.8)	> 0.05	Reference	N/A	Reference
Male	678 (43.9)	704 (42.2)		0.93 (0.81 – 1.07)		0.90 (0.78 – 1.04)
Number of morbidities						
One	143 (9.3)	255 (15.3)	**< 0.01**	Reference	Reference	Reference
Two	973 (63.0)	885 (53.1)		**0.51 (0.41 – 0.64)**	**0.49 (0.39 – 0.61)**	**0.53 (0.42 – 0.67)**
Three	391 (25.3)	467 (28.0)		**0.67 (0.52 – 0.86)**	**0.65 (0.51 – 0.83)**	**0.69 (0.53 – 0.90)**
Four or more	38 (2.5)	61 (3.7)		0.90 (0.57 – 1.41)	0.91 (0.57 – 1.44)	0.90 (0.54 – 1.50)

	Stayed ≤ 1 year, N = 1, 545	Stayed for > 1 year N = 1, 668	p-value**	Odds of staying for > 1 year		
	N (%)	N (%)		Crude OR (95% CI)	Adjusted OR for Age and Gender ONLY (95% CI)	Adjusted OR (95% CI)
Number of prescribed medications						
0	25 (1.6)	30 (1.8)	**< 0.01**	Reference	Reference	--
1	532 (34.4)	454 (27.2)		0.71 (0.41 – 1.23)	0.66 (0.37 – 1.16)	
2 - 3	573 (37.1)	730 (43.8)		1.06 (0.62 – 1.82)	1.01 (0.57 – 1.76)	
≥ 4	415 (26.9)	454 (27.2)		0.91 (0.53 – 1.58)	0.88 (0.50 – 1.56)	
Diagnosis* **						
Hypertension	857 (55.5)	912 (54.7)	0.65	0.97 (0.85 – 1.11)	0.93 (0.80 – 1.08)	--
Type 2 Diabetes Mellitus	569 (36.8)	610 (36.6)	0.88	0.99 (0.86 – 1.14)	0.96 (0.83 – 1.11)	--
Cardiovascular disease	120 (7.8)	201 (12.1)	**<0.01**	**1.63 (1.28 – 2.06)**	**1.66 (1.30 – 2.11)**	**1.33 (1.02 – 1.75)**
Hypothyroidism	100 (6.5)	65 (3.9)	**<0.01**	**0.59 (0.43 – 0.81)**	**0.57 (0.41 – 0.79)**	**0.56 (0.40 – 0.79)**
COPD/Asthma	106 (6.9)	94 (5.6)	0.15	0.81 (0.61 – 1.08)	0.81 (0.61 – 1.08)	--
Epilepsy	88 (5.7)	81 (4.9)	0.29	0.85 (0.62 – 1.15)	0.93 (0.66 – 1.32)	--
Type 1 Diabetes Mellitus	30 (1.9)	39 (2.3)	0.44	1.21 (0.75 – 1.96)	1.36 (0.82 – 2.24)	**--**

* Bolded figures indicate statistically significant ($p < 0.05$) findings on chi-square testing and regression analysis

** p-values refer to chi-square tests

*** Analysed as dichotomous variables – (diagnosis versus no diagnosis)

7.5 Discussion

In this study, I report on a group of patients with non-communicable diseases presenting for care between 2013 and 2016 at four MSF primary health care clinics in the Bekaa valley in Lebanon. The nearly 8000 NCD patients that presented for care over nearly four years represent about a quarter of all patients seen at these clinics in the same time period. A well-functioning PHC system needs to monitor and adapt to population needs (57). This includes performing surveillance for diseases, setting priorities and learning and innovating (57). While the concept of surveillance and priority setting is not a new one for the humanitarian community, this concept has typically been applied to surveillance for communicable diseases, particularly regarding their potential to cause disease outbreaks. This analysis builds the case for surveillance of non-communicable diseases as well, in order to better respond to the specific needs of a target population. Understanding the most prevalent conditions and demographic distribution presenting at a health facility level can serve as a proxy guide for the pattern of morbidity which may be present in the community. This can allow humanitarian service providers and policy-makers to better plan the humanitarian response and adjust priorities according to the needs of the population.

The majority of NCD patients presenting for care were Syrian refugees aged between 40-59 years (48%) with close to a third of patients being 60 years or older (32%). Approximately 60% of all patients were female. The preponderance of females likely reflects the greater number of female Syrian refugees registered with UNHCR in Lebanon (53%) and specifically in the Bekaa valley (54%) (244, 288). The age and gender profile of patients seen in this study is similar to a study of Syrian refugees with type 2 DM and hypertension presenting to an MSF clinic in the Shatila refugee camp, Lebanon where 63% of patients were females and 56% aged between 40 – 59 years (305). Although the epidemiological picture of NCDs in Syria prior to the conflict is limited, available data from cross-sectional surveys indicate that the prevalence of NCDs increases with age; the highest prevalence of T2DM and hypertension are in those over 55 to 60 years of age (306-308). A possible explanation for the discrepancy between the survey data and the data presented here, is that there is a lower proportion of Syrian refugees over 60 years of age in Lebanon, compared to that expected from the general Syrian population (see Appendix 2).

The two most common NCDs that were seen in all four clinics were hypertension (54%), and type 2 DM (37%). Both these conditions were most prevalent in the 40 to 59 year old age group and in women. Women made up 63% of all those with hypertension and 59% of type 2 diabetics. These findings are similar among Syrian refugees seeking care at a PHCC in Lebanon (305), but not from studies conducted in Syria prior to the conflict. Longitudinal, large-scale, population-based data on

NCDs in Syria is limited. Most published research on NCD epidemiology and risk factors in Syria come from the work conducted by the Syrian Centre for Tobacco Studies in Aleppo, Syria's most populous city (306, 307, 309-311). These studies give the most information on cardiovascular disease (hypertension included) and type 2 DM in Syria prior to the conflict. Prevalence of hypertension in these cross-sectional studies range from 46% (306) to 56% (308), both reporting higher prevalence in men than women (306, 308). The prevalence of type 2 DM among adults older than 25 years old range from 16% (306, 307) to 24% (311), with similar prevalence in males and females (306, 307). Therefore, men may not be coming to care for their NCDs at the numbers that would be expected based on what is known about the epidemiology of T2DM and hypertension in Syria before the conflict. It was interesting to note however, that males who did come for care at MSF clinics had greater odds of staying in care past six months than females. A possible explanation for this is that it may be easier for males to access clinics either by walking or having the means to pay for transport. It may also be explained by the number of female-headed households (defined as a household in which an adult female is the sole or main income producer and decision-maker) among Syrian refugees in the Bekaa valley, which was the highest in Lebanon in 2016 (288). Twenty-seven percent of Syrian refugee households were headed by females in the Bekaa valley compared to 20% in Lebanon overall (288). If these women are doubly burdened by an NCD, they may face greater challenges in seeking services at a healthcare facility due to their duties as head of the household.

Most NCD studies on Syrian refugees in the middle-Eastern region presenting for care predominantly report on the two most prevalent conditions seen – type 2 DM and hypertension (290, 305, 312). This analysis provides a more comprehensive overview of NCDs seen among Syrian refugees at the PHC level. In addition to hypertension and type 2 diabetes mellitus, other conditions seen among Syrian refugees included cardiovascular diseases (9%), COPD/Asthma (8%), hypothyroidism (~6%), epilepsy (~6%) and type 1 diabetes mellitus (2%). These figures are in keeping with commonly reported chronic conditions in household surveys of Syrian refugees in Lebanon. After hypertension and type 2 DM, COPD/Asthma and heart disease were most commonly reported in the 2016 UNHCR health access and utilisation survey among Syrian refugees in Lebanon (253). In 2017, arthritis was most commonly reported, followed by hypertension and asthma/respiratory disease (313). There is almost no published data on hypothyroidism, epilepsy and type 1 DM among Syrians prior to the conflict. However, more than 90% of patients with these conditions seen at MSF clinics in the Bekaa valley had previously diagnosed disease, most likely made in Syria. While most studies focus on older patients with NCDs, it is important to bear in mind that NCDs, such as epilepsy and type 1 DM predominate in the paediatric (17 years and younger) and young adult age groups. Therefore service

providers have to ensure that this patient population is adequately considered when planning services.

Continuity of care in this study was measured by the length of time that patients attended one of the four MSF clinics in Bekaa valley between January 2013 and November 2016. Over the four years, the median length of follow-up of all patients was seven months. The lowest median follow-up time of four months was at Baalbeck clinic, patients attended Majdal Anjar and Hermel clinics for a median of six months and the longest follow-up period of 14 months was at Arsal clinic. While there were no major differences in age, gender or types of diagnoses between Majdal Anjar and Arsal clinics, the regression analysis confirmed that the odds of patients staying in care for one year or longer at the Majdal Anjar clinic was 49% lower than at the Arsal clinic. The longer follow-up at Arsal is likely due to fewer available clinics in this town compared to the rest of the Bekaa valley, as explained in the previous chapter. It could also have been due to more patients enrolling in this clinic in 2014, compared to other clinics where enrolment was greater in 2015 and 2016. At the MSF Shatila primary care clinic in Beirut, which is established inside a refugee camp, the median follow-up time for patients in the program between 2013 and 2017 was 13 months (305) – a similar time to Arsal. It is interesting to note this similar length of follow-up at Arsal clinic in a non-camp setting, but in a town with severely restricted movement due to insecurity and the clinic at Shatila based inside a refugee camp.

Follow-up time also varied by type of NCD diagnosis. Patients with a diagnosis of COPD/Asthma stayed for a median length of five months in the program, while those with cardiovascular disease and type 1 DM had the longest median follow-up time of nine months. The regression analysis indicated that those with cardiovascular disease are more likely to stay in care for more than one year compared to any other diagnosis. The majority of patients with cardiovascular disease were greater than 40 years of age, with multiple comorbidities and prescribed medications. It is likely that these patients are well-educated on their requirement and dependence on lifelong medications which likely makes them come to care for longer. This does make this group particularly vulnerable in the setting of displacement and treatment interruption.

A surprising result that warrants discussion is the inverse relationship between the number of morbidities that a patient had and staying in care for more than one year. It would seem plausible that the more morbidities a person had, the greater the odds of staying in care for a longer period of time. In fact, those with two morbidities compared to those with one were less likely to stay in care for more than one year. These results are different to those seen in Chapter 6, where on univariable analysis, there was a positive linear relationship between the number of co-morbidities and making

10 or more visits to a MSF clinic. This is to say, that the more co-morbidities a patient had, the greater the odds of visiting an MSF clinic 10 or more times. However, this result was not statistically significant on multivariable analysis. It is possible that people who have an awareness of their pre-existing condition are more comfortable self-managing their illness. It could also be that these patients were able to access other non-MSF facilities that emerged at various points in time.

Ensuring continuity of care for non-communicable diseases among displaced populations presents a particular challenge for service providers. There is a paradox between the need for following up patients over a long period of time while operating in an environment of continual flux for an uncertain period of time. However, from studies conducted in high income countries, it is known that maintaining longitudinal continuity of care – i.e. seeing the same doctor builds trust and a sense of mutual responsibility between a patient and their treating medical provider (297, 314). Further, continuity of care at the primary health care level has been shown to reduce hospital admissions, improve patient outcomes and satisfaction (300, 315). It is therefore important that humanitarian actors make an attempt to understand enabling and inhibiting factors which allow the target population to seek ongoing health care for their illnesses.

Continuity of care in this study was only measured by duration in the program, and not by other measures such as the strength of the patient-doctor relationship, loyalty, trust and patient satisfaction, as has been reported in other studies (316). To study retention-in-care, another method that could have been employed is survival analysis. However, it is possible and likely that patients dropped in and out of these NCD clinics. Therefore, in order to investigate continuity of care, I only looked at those patients who had been enrolled in a NCD clinic for at least 12 months, thereby presenting equal opportunity to study the characteristics of those who continued to remain in care for another 12 months and those who dropped out beforehand.

There are other limitations to this study which should be considered. The data presented here is facility-based and factors influencing patients accessing care at MSF clinics – such as geographic accessibility, perception of care received, etc., may create a sample bias in the characteristics of individuals seen. Results may not be generalisable to the wider Syrian refugee population in the Bekaa valley or in Lebanon. There may also be inter-variability in diagnosing diseases between the four MSF clinics. As the data was conducted on routinely collected data, it was not possible to adjust for other possible confounding factors such as level of education, level of household income or socio-economic status which may have had an impact of length of follow-up.

Despite these limitations, I was able to make meaningful conclusions about the characteristics of patients presenting for care at MSF clinics in Lebanon, which can help to inform health service policy

targeted at NCDs. Understanding the local epidemiology in the area of intervention by conducting surveillance of communicable *and* non-communicable diseases is crucial for humanitarian actors to cater to the populations health needs. Setting priorities and adjusting them according to available epidemiological information is a part of this. Owing to the chronicity and complexity of NCDs, the care of NCDs requires continuous monitoring and follow-up. Continuity of care in this context also relies on an understanding of the patient's conditions and the factors which affect them seeking care.

Further studies to identify factors preventing people over the age of 60 and men with chronic diseases to seek health care are necessary. It would also be interesting to understand the barriers for ongoing follow up for women and for patients with cardiovascular disease. In addition, people with type 1 diabetes present a particularly vulnerable group who would require further attention at the PHC level.

With a permanent population of just over 5 million, Lebanon now has the highest concentration of refugees per capita in the world (246). The refugee influx has placed unprecedented strain on the Lebanese health care system, which is struggling to cope with the additional services and infrastructure required to provide care for the increased population (247, 251, 282). The protracted nature of the conflict means that the humanitarian response must increase its focus on non-communicable diseases.

Chapter 8 Conceptual framework

8.1 Preamble

The literature review and the case studies presented thus far have highlighted various aspects of PHC service delivery by international actors across a range of humanitarian settings. The literature review identified that PHC is conceptualised differently by different international humanitarian actors, and that each have different priorities for action based on their own needs assessment and mandate. The analysis of 'context' in a maternal health care project in northern Nigeria underscored the importance of understanding the social, cultural, demographic and other contextual factors when planning an intervention. In addition, this analysis showed that it is important to comprehend the capacity of the national PHC system when considering its influence on achieving a health program's overall objective. The analysis of NCD data of patients presenting to MSF primary health care clinics in the Bekaa valley in Lebanon highlighted that local security conditions influenced geographic accessibility and availability of PHC services, and that continuity of care of patients presenting for NCDs was dependent on several individual-level characteristics.

These findings, along with my operational field experience with MSF delivering PHC in humanitarian emergencies, have allowed me to develop a deeper appreciation of the many diverse and sometimes unpredictable factors that influence service delivery in humanitarian emergencies. Despite this level of unpredictability, my experience with MSF has been that MSF has had the same approach to PHC service delivery in very different contexts. There has been a similar model of care with a relatively 'top-down' approach, where services are delivered to people, and not with people. This approach has been similar, whether the setting has been in remote parts of sub-Saharan Africa or in urban cities in the Middle-East. However, in order to make recommendations on how services could be delivered differently, a better understanding of the complex health system that is formed during a humanitarian emergency is required. It is against this background, that this chapter has been developed.

In this chapter, I develop a conceptual framework of the PHC system that is required to achieve the core components of primary health care service delivery during a humanitarian emergency. While case studies provide essential information and valuable 'lessons learnt', an overarching framework is useful to make these findings generalisable and to consider how these case studies can be used to inform future practice. In developing this framework, I apply principles of complex adaptive systems theory and the WHO framework on integrated people-centred health systems. I also consider contextual factors that affect service delivery, the main stakeholders involved in providing and

receiving PHC services, the key principles of primary health care service delivery and the element of time. It is envisaged that this framework can be used to inform the most appropriate approach to take by international actors when designing PHC interventions in a humanitarian emergency setting.

This chapter is divided into three parts. First, I discuss the theoretical underpinning of the conceptual framework which is that of complex adaptive systems (CAS) and how CAS theory applies to the health system in humanitarian emergencies. I also briefly describe the WHO framework on integrated people-centred health systems which informs my framework. Next, I describe the conceptual framework, the components of the framework, its utility and its strengths and limitations. Finally, I end with summary remarks of this chapter.

8.2 Theoretical underpinning

The development of this conceptual framework was guided by key principles and characteristics of complex adaptive systems (CAS) and influenced by the WHO framework on integrated people-centred health systems. The principles of CAS are described in further detail below, as well as their application to the humanitarian system. This is followed by an explanation of the importance of recognising that the primary health care system in a humanitarian emergency is a CAS.

8.2.1 Systems thinking and Complex Adaptive Systems

Meadows describes systems thinking as a "way of thinking that allows relationships between structure and behaviour to be worked out so that we may be able to understand how systems work, what makes them produce poor results and how to shift them into better behaviour patterns" (317, page 4). Systems thinking allows us the freedom to identify root causes of problems and recognise new opportunities (317). While there are varying definitions of the term 'system' (317-319), a commonly accepted definition is that a system is a "set of elements or parts that are coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviours, classified as its 'function' or 'purpose'" (317, page 11). The essential components of this definition are that a system must contain three kinds of things: elements, interconnections and a function.

Not all systems are complex, but there are many kinds of complex systems. Classifications of complex systems have evolved from different fields of study – mathematics, ecology, economics, social science and others (318, 319). Some examples of these include simple complex systems, complex adaptive systems, complex social systems and complex responsive processes (319). In considering the *primary health care system* that may exist *in a humanitarian emergency*, I believe

that the principles of complex adaptive systems most apply to this system under study. There is no simple or most commonly used definition of a complex adaptive system. However, they are generally accepted to be systems which "exhibit behaviours arising from non-linear, spatio-temporal interactions among a large number of components and sub-systems" (320, page 5). Figure 8.1 provides a visual representation of this statement. The essential principles of CAS and their application to the setting of PHC delivery in humanitarian emergencies are described below.

Figure 8.1: Representation of the components of a complex adaptive system

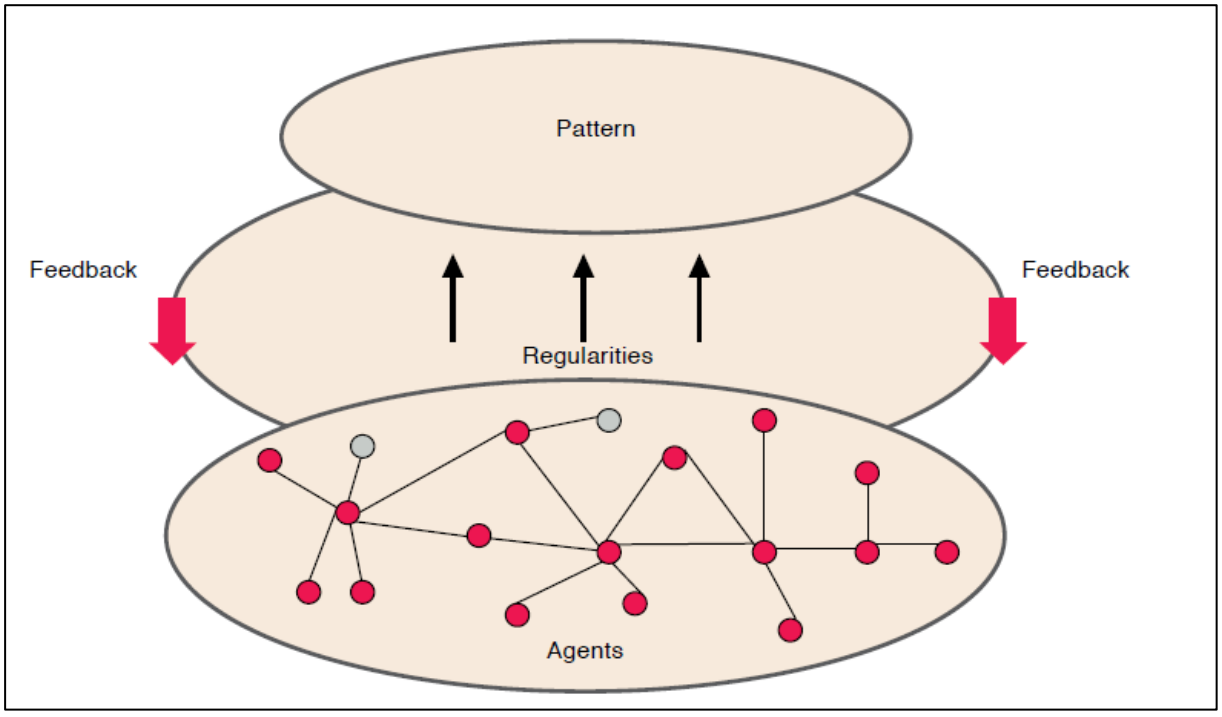


Figure adapted from The Health Foundation (2010), Evidence scan: Complex adaptive systems, available from: https://www.health.org.uk/publications/complex-adaptive-systems

Principle 1: Large Number of Diverse Agents

For a system to be considered complex, there must be multiple agents interacting with each other (321). These agents are heterogeneous, differing in important characteristics (diversity) (320). Each agent may have a different agenda which tries to pull or influence the system accordingly (322). An agent's performance depends on the other agents and the system itself, each of which can influence the other's behaviour (320, 323, 324). Agents may be organised into some sort of group hierarchy which may be structured (317). These organisational structures in turn influence the dynamics of the system (317, 324). The more the agents, the greater the likelihood of encountering chaos or complexity (321, 323).

This principle of a large number of diverse agents certainly holds true for the humanitarian system, making this system complex. The humanitarian system is made up of a wide variety of diverse

organisations, agencies and inter-agency networks including government agencies, UN agencies, the International Red Cross/Red Crescent Movement, non-government organisations, military institutions, local government institutions and donor agencies (325). These organisations, agents, actors each have their own mandate for humanitarian action. Increasingly, in today's humanitarian emergencies, there are numerous intervening actors, sometimes upwards of one hundred. For example, in the ongoing refugee emergency crisis in Bangladesh where more than 435,000 people from Myanmar have sought refuge in Bangladesh, there were 107 different humanitarian organisations present in UNHCR-managed camps as of April 2019 (326). Another example is that of the ongoing protracted crisis in South Sudan, the largest refugee situation in the African continent, which involves about 95 humanitarian organisations responding to the needs of over 2.5 million people, with some organisations having a near-permanent presence (327).

While these actors are heterogeneous, since 2005, they have been organised into a group structure called 'clusters', an initiative introduced by the UN to improve coordination between actors involved in the humanitarian response (328). Agencies are organised into the various cluster groups of Health, Logistics, Nutrition, Protection, Shelter, Water, Sanitation & Hygiene, Camp coordination and camp management, Education, Emergency telecommunications, Food security and Early recovery (329). The health sector is often led by the national health system in collaboration with the WHO, who are both major actors in the health system of a humanitarian emergency (329). Various international health actors enter the system at various points in an emergency according to their own capacity. Although every sector and agents within each sector may work towards the same goal of delivering humanitarian assistance, as the literature review identified, every organisation also has their own objectives, thereby exerting influence on the system.

Principle 2: Complex systems consist of inter-connected parts

This principle of inter-connection refers to the idea that every element is connected to every other element in the system, even indirectly (320). According to Kaisler, the way in which these elements connect and relate to one another is critical to the survival of the system (320). It is thought that the more inter-dependency between actors, the more they need to interact if they are to succeed (323). It is from these connections that patterns within a system are formed and feedback disseminated (317). It is considered that relationships between the agents in a system are generally more important than the agents themselves (320).

In the humanitarian health system, the numerous health service providers present are intricately connected to each other. Each agency will maintain its independence and have their own mandate, set of expertise, skills and knowledge, however, they rely on each other for information, for

resources, and for advice. They are networked and inter-connected. Take for example, a commonly occurring situation in which an iNGO may be providing primary health care services within a specified geographic boundary while another may be operating to provide secondary health care services in the same area. These two actors are highly inter-dependent by virtue of their activities that are highly related to each other. The more these two actors interact, the more likely they are to succeed in achieving their objective of delivering the required health services to the target population. The individual objectives of various health organisations may not necessarily align with each other, but they affect and are being affected by each other.

Agents within different sectors of the humanitarian system are also inter-connected. For example, the Water and Sanitation cluster group and the Nutrition cluster group are intimately connected to the Health cluster group. As an example, a relatively common occurrence in a refugee camp setting is outbreaks of diarrheal disease (7). An outbreak may be first detected by health service providers in the Health cluster. These actors are then able to share this information with their counterparts in the Water and Sanitation group to enable them to assess the need and if necessary, provide adequate water and sanitation facilities for affected individuals.

The principle of inter-connection can also be applied to the coordination of activities between international actors and the national health system. International actors need to work closely with the existing national health system and its counterparts to provide effective humanitarian assistance. The stronger the relationship with the national health system, the easier it will be for an international actor to work in that country. Complex systems are multi-dimensional and all the dimensions interact and influence each other constantly (323).

Principle 3: Interactions among elements of a system are non-linear

A defining feature of complex systems, that separates it from complicated or simple systems, is that interactions within complex systems are non-linear (317, 322). In a simple or linear system, a small change to a system's components will result in a small change at the system level (320). However, in a complex, non-linear system, a small change to a system's components may result in a large, small or no change at the system level (320). There are reiterative feedback loops governing the dynamics of the system, resulting in a net amplifying effect on some parts of the system (positive feedback) or a dampening effect on others (negative feedback) (319, 323). The presence of feedback loops makes a system complex and more than the sum of its parts (317).

Non-linear interactions are difficult to calculate or measure due to their complexity (330). Anderson says that "modelling non-linear outcomes of many interacting components has been so difficult that both social and natural scientists have tended to select more analytically tractable problems" (330).

Another way of saying this is that we try to reduce complexity to simple linear models. However, this reduction of complexity can produce deficient and incomplete reflections of reality (322).

The humanitarian health system is non-linear. Take for example, a simple intervention such as oral rehydration sachets for the prevention and treatment of dehydration caused by diarrhoeal diseases. These sachets which have existed since the 1970s and 80s, have had a significant impact on health status, estimated to reduce diarrhoea mortality by up to 93% (331). Conversely, larger system-level initiatives such as the Bamako Initiative of 1987, which aimed to increase access to essential drugs through community participation in revolving drug funds, had arguably limited impact on causing system-level changes as initially intended (332, 333). These examples highlight that a small change to a system component can have a large system-level impact, while a larger change may have little to no impact.

Principle 4: Self-organisation

Self-organisation is the capacity of a system to make its own structure more complex (317). Meadows details that self-organisation requires freedom, experimentation and a certain amount of disorder (317). Kaisler explains further that there is "no planning or managing involved in a CAS, but there is constant re-organizing to find the best fit with the environment" (320, page 22). The example that is given by Kaisler is that if one were to take any western town and add up all the food in the shops and divide this by the number of people in the town, there will be nearly two weeks supply of food, but there is no food plan, food manager or any other formal controlling process (320). The system is continually self-organising through the process of emergence and feedback.

In the process of creating new structures and increasing complexity, one thing that a self-organising system often generates is hierarchy (317). A hierarchy is an arrangement of systems and sub-systems (317). Meadows describes that complex systems can evolve from sub-systems, akin to the way in which a cell in the kidney is a sub-system of an organ, which is a sub-system of a human, and a human is a sub-system of a family, a community, a country and so on (317). These sub-systems are said to be nested (317). In hierarchical systems, relationships *within* each subsystem are denser and stronger than relationships *between* sub-systems (317). Everything is still connected to everything else, but connections between sub-systems can be weak (317).

In humanitarian emergency settings, the principle of self-organisation can be seen with the humanitarian response by the various actors involved. There are no formal controlling processes governing the response by a certain agency in a particular situation and the exact mechanisms they will use to operate. Each actor will organise their own response. The sub-systems formed by numerous actors organising themselves around an objective such as Health or Nutrition or Shelter

will manage itself through feedback processes, communication loops and structures, to ensure that needs of the affected population are met.

Similarly, at a more granular level, a medical team providing health care to beneficiaries will form its own system with staff, patients, supplies, processes and so on. The medical team interacts with other medical and non-medical teams at the local level, other systems and sectors at the local and national level. This team is nested within a larger organisation with its own set of governing rules and principles, which is a system in itself. This is also an example of hierarchy. Hierarchical organisational structures are often seen among iNGOs such as MSF or ICRC and others. An organisational hierarchy is formed between the field level, the coordination level (often in the capital-city of the affected country) and at headquarters level, often outside the affected country. These varying levels of organisation or sub-systems each have different objectives. Often the relationships within each of these sub-systems are denser and stronger than the relationships between sub-systems. The same could be said of the relationship between various health service providers. The relationships within the sub-system of a given iNGO will be stronger than the relationships between different actors.

Principle 5: Emergence

Closely linked to the concept of self-organisation is the principle of emergence. Emergence refers to a pattern of behaviour that results from the activities and behaviours of the system, but which cannot be predicted by an analysis of the behaviour of the component parts alone (319, 320). This system-level behaviour evolves from the interaction of agents at a local level without external direction or the presence of internal control (319). The resulting emergent structure is neither planned nor predicted, but enables complex systems to adapt and self-organise in response to external challenges (323, 330).

In a humanitarian emergency, the interaction of a diverse number of agents working in a given environment will result in a characteristic humanitarian response. Although this response is unpredictable in advance, due to the nature of changeable system elements and non-linear relationships, there is an overall pattern to how the humanitarian system will behave. Multiple actors will bring in their own expertise, resources and mandates to a humanitarian response and patterns of behaviour will emerge as a consequence of interaction between actors. As an example, inevitably there will be a response from the health sector to provide health services to an affected population. Often these health service providers have pre-meditated roles which are well-known to each other and to the humanitarian system: for example, the WHO will work together with the national health system to coordinate the response, the ICRC will work with local Red Crescent/Red

Cross societies to deliver secondary health care and/or community level care, and organisations such as MSF will provide emergency medical services. Although the nature of the response is unpredictable in different emergencies, often a characteristic pattern will emerge from interactions of multiple actors operating within the humanitarian system.

Principle 6: The system changes over time

For a complex system to be considered adaptive, information-sharing between individual elements needs to change over time as learning and adaptation occurs in response to other elements (320). Through the generation of new patterns, behaviours, relationships and structures, agents interact, adapt and change in response to feedback from their actions (319, 323). The system is dynamic and is able to adapt to new conditions and environments (323).

In humanitarian emergencies, this principle is easily seen as systems change to adapt to the evolving nature of an emergency. Often, what is required of the humanitarian system in the first few days after a natural disaster or acute period of a conflict is different from what will be required six months or one year after an emergency. Agents, elements and processes within a system will constantly adapt themselves and their intervention strategies to response to what is required in a particular phase of an emergency. For an example, immediately after typhoon Haiyan in the Philippines in 2013, the strongest typhoon to have made landfall in the country (334), the immediate health response that was required involved managing the dead, managing the risk of communicable diseases such as rabies, dengue and measles and providing services for mental health support (30). However, three to seven months after the typhoon, the health sector was geared towards recovery with more focus on re-establishing surveillance programs, improving referral services for maternal and child health and non-communicable diseases, as well as improving coordination for people with disabilities (30). The humanitarian system is dynamic and able to respond to the pressures exerted by the external environment.

Principle 7: Co-evolution

Co-evolution refers to the notion that the evolution of one system influences and is influenced by other systems (330). All systems exist within their own environment and they are also a part of that environment (323). As their environment changes, they need to change to ensure best fit. However, because they are a part of their environment, when they change, they change their environment, and as it has changed, they need to change again, and on it goes as a constant process.

The principle of co-evolution is evident from the case study described in Chapter 4, outlining MSF's intervention in northern Nigeria. The intervention by MSF to provide emergency obstetric care at

the secondary health care level changed the health system in Jahun. By addressing a gap in the system, this new intervention created an increased demand and dependency on its services which did not exist prior to its establishment. The intervention was also influenced by the national health system and by feedback processes driven by recipients of health care. As the health environment changed in Jahun, MSF changed its own intervention strategies to adapt to the changing environment. This process is continuous as long as these multiple actors in the system are interacting with each other and changing the operational environment within which they are working.

8.2.2 Recognising the primary health care system in a humanitarian emergency as a complex adaptive system

From the above description, it can be seen that the humanitarian system and indeed the primary health care system that is formed in a humanitarian emergency, is the epitome of complexity. While it may seem academic to define the primary health care system as a complex adaptive system, there are important implications for making this distinction. The primary implication is in fact pragmatic. It is necessary to recognise that the primary health care system in a humanitarian emergency is a complex adaptive system in order to develop appropriate intervention strategies and policies that aim to address problems within the system. In order to develop the most appropriate and effective implementation strategies for the primary health care system in a humanitarian emergency, international actors have to be aware of the system within which they are operating.

Meadows suggests that ever since the Industrial Revolution, western society has benefited from science, logic and reductionism over intuition and holism (317). It is much easier to assume the cause of a problem is 'out there' than 'in here', and it is easy to look for the control knob, the product, the pill, or the technical fix that will make a problem go away. Serious problems have been solved by focusing on external agents – preventing smallpox, increasing food production, moving large weights and many people rapidly over long distances (317). However, because these problems are embedded in larger systems, Meadows suggests that some of our 'solutions' have created further problems. The real problems, those most rooted in the internal structure of complex systems, have refused to go away. For example, some of the most complex problems such as hunger, poverty, chronic disease, and climate change persist despite the analytical ability and technical brilliance that have been directed towards addressing them. These problems persist because they are intrinsically systems problems – caused as a result of undesirable behaviours produced by the dynamics and structures of systems in which they lie. These 'wicked problems' can only be tackled if we think differently to the way that these problems were created. Meadows suggests that we need

to “reclaim our intuition, stop casting blame, see the system as the source of its own problems, and find the courage and wisdom to restructure it” (317).

Recognising that the primary health care system in a humanitarian emergency is a complex adaptive system will force us to think in causal loops instead of causal chains. It is easy to learn about a system’s elements. However, it is much harder to learn about the system’s inter-connections. Actors within the humanitarian system need to understand that the system cannot be understood just by knowing its system components. It is necessary to consider the causal links between key system variables, the dynamics of the inter-connections and how these change over time in order to understand the behaviour and intervene in the complex system they are working in.

When international actors intervene in any given humanitarian emergency, they enter into a country with existing systems. Among the many systems that international health organisations deal with, the most significant is the existing national health system of the country. In keeping with the principles of CAS, the introduction of any intervention in a country by an iNGO will change the health system of that country – either directly or indirectly. Undoubtedly, these interventions will be introduced in the hope that they will have positive health effects. However, inevitably some interventions are likely to also have negative, unintended consequences. By understanding the broader environment and context in which particular initiatives are implemented, as well as understanding the linkages and interactions between elements of the system, international health actors may be better able to develop targeted intervention that can have maximal impact on the health system.

In complex environments that change all the time, humanitarian practitioners cannot anticipate all situations. We cannot pre-design an intervention that is always guaranteed to work. However, we can attempt to understand the variables that might have an impact on the desired outcomes of our interventions.

8.2.3 Integrated people-centred health services

The development of my conceptual framework was also informed by the WHO framework on integrated people-centred health services (335). People-centred health services means putting people and communities, and not diseases, at the centre of health systems (336). It means empowering people to take charge of their own health rather than being passive recipients of services. Evidence shows that health systems oriented around the needs of people and communities are more effective, cost less, improve health literacy and patient engagement, and are better prepared to respond to health crises (336).

Integrated health services means managing and delivering health services in a way that ensures people receive a continuum of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative care services at the different levels and sites of care within the health system and according to their needs, throughout their whole life (336).

The conceptual framework on integrated people-centred health services developed by WHO helps to map the relationships between different parts of the health ecosystem that provides the context for people-centred and integrated health services (Figure 8.2). This framework presents individuals, families and communities at its centre, placed within a service delivery context composed of integrated networks and linkages within the health sector, as well as direct inputs from communities. This happens within the context of the governance, financing and resources of the sector. The framework acknowledges the need for intersectoral action in tackling the structural determinants of health and the close collaboration required between health, social care, education and the wider range of local services that can all contribute to better health for individuals, families and communities.

The framework also highlights that progress toward people-centred and integrated health service delivery must be supported by an enabling policy environment encouraging close collaboration between health and other sectors to improve population health. Finally, the varying country and regional settings in which this strategy will be applied, provide the environmental context for the framework.

People-centred integrated care initiatives have gained favour in recent years with the increasing push towards universal health coverage. This initiative recalls the principles of a primary health care approach by striving for service provision that is tailored to an individual's needs for continuous, appropriate, responsive and acceptable care to the population that the system aims to serve (336).

Figure 8.2: World Health Organization framework on integrated people-centred health services

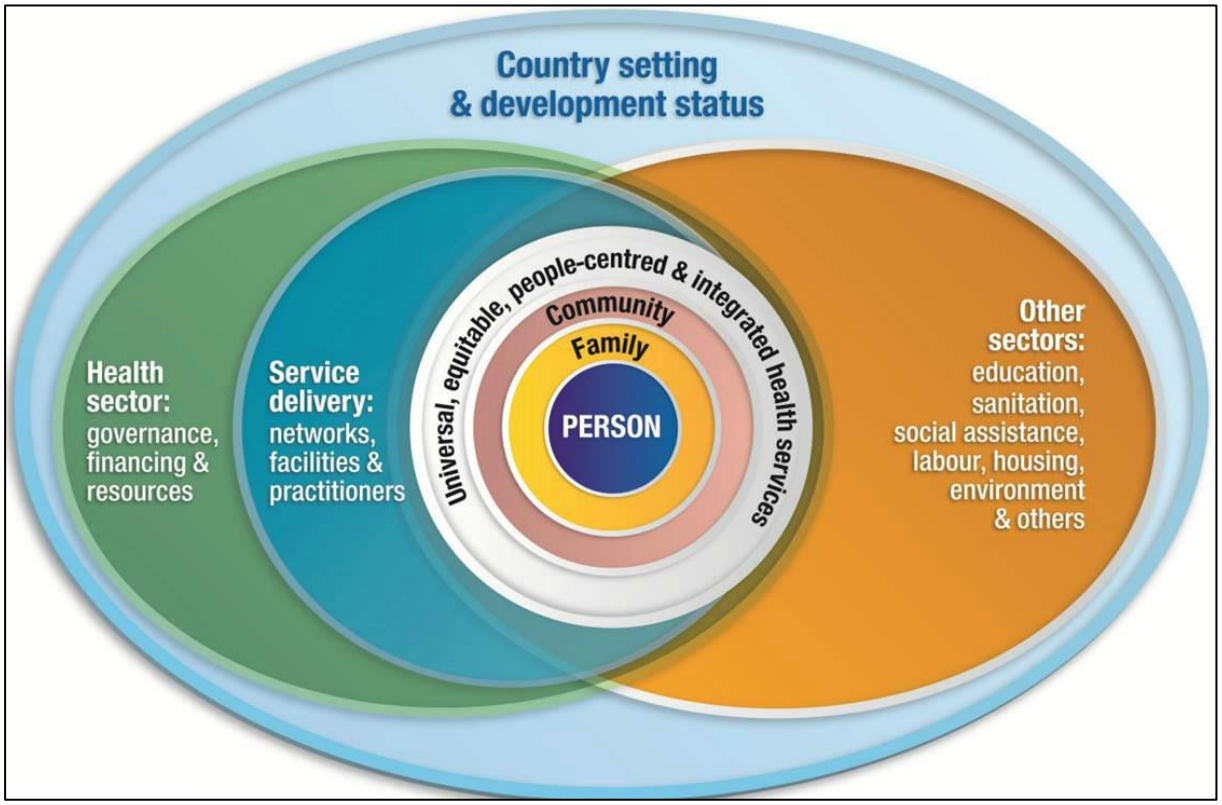


Figure adapted from the WHO Framework on integrated people-centred health services, available from: https://www.who.int/servicedeliverysafety/areas/people-centred-care/en/

8.3 Developing a conceptual framework for primary health care service delivery in a humanitarian emergency

George Box, a 20th century statistician famously once said, "All models are wrong but some are useful". In order to make sense of the world around us and act, we construct models (319). These models attempt to emulate reality, search for relationships and regularities based on our experiences (319). However, Kernick explains that models may simplify reality and in this way, lose intuitive insights. He describes that the use of metaphor can help to retain these intuitive insights – "metaphors offer a framework to think and act differently" (319). This conceptual framework that I have developed is a metaphor for how I see the primary health care system that is formed during a humanitarian emergency and how it can be used to develop approaches to deliver PHC services to populations affected by humanitarian emergencies. It is envisaged that this conceptual framework may be used by international actors when developing intervention strategies for primary health care programs in humanitarian emergencies.

8.3.1 Components of the humanitarian primary health care system

To reiterate, the definition of a system as described by Meadows, is a: "set of elements or parts that are coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviours, classified as its 'function' or 'purpose'" (317, page 11). The components of this definition: the purpose, the elements and the interconnections, as they relate to the primary health care system in a humanitarian system are described below.

8.3.1.1 ***Purpose of the primary health care system in a humanitarian emergency***

There is no clearly articulated or well-accepted 'purpose' or 'function' of the primary health care system in a humanitarian emergency, as declared by the humanitarian community. However, the Sphere guidelines highlight that the overall objective of the health sector in a humanitarian emergency is to reduce the excess morbidity and mortality in the affected population (61). To this effect, the **purpose** of the humanitarian primary health care system can be thought to be contributing to the reduction of excess morbidity and mortality in the affected population, and enabling health system recovery.

8.3.1.2 ***Elements of the primary health care system in a humanitarian emergency***

The conceptual framework developed by the Primary Health Care Performance Initiative (Figure 8.3), which has been used as a guiding framework throughout this thesis, describes the key components of an effective PHC system particularly for low and middle income countries. While it was not my intention to re-define these components in the setting of humanitarian emergencies, the literature review identified that at least some of these framework components are relevant in this setting. However, these components may need to be further defined and/or adapted. In addition, some unique features of the humanitarian system not described in the PHCPI conceptual framework, need to be highlighted. These include the context, the key actors (sub-systems) in the humanitarian health system and their components.

Figure 8.3: Primary health care Performance Initiative conceptual framework for performance of a primary health care system

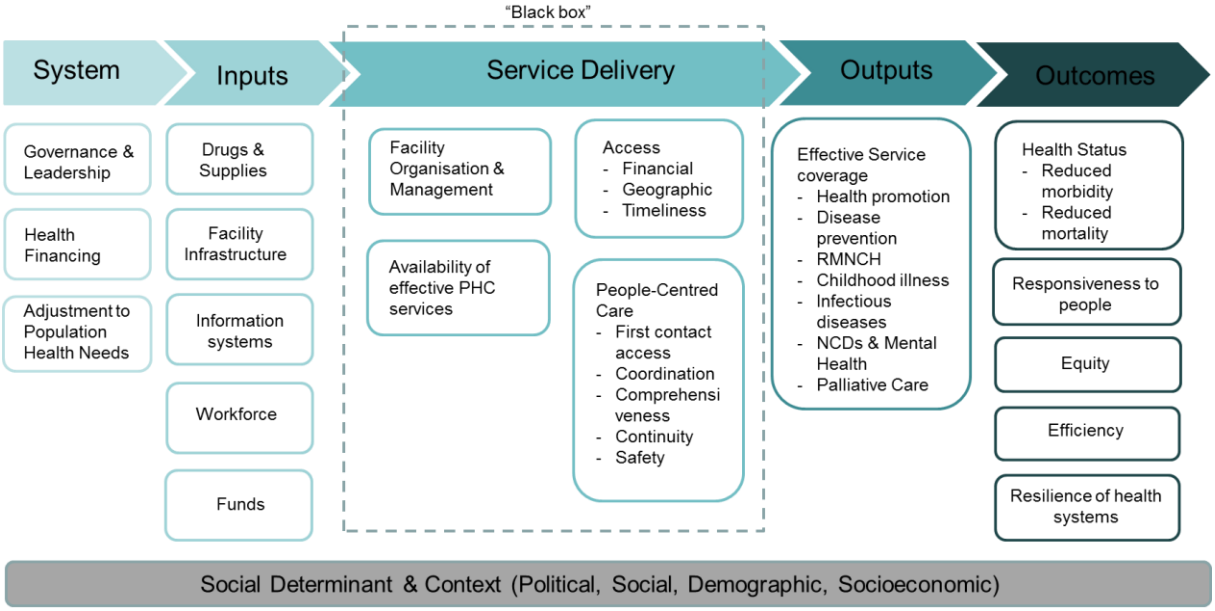
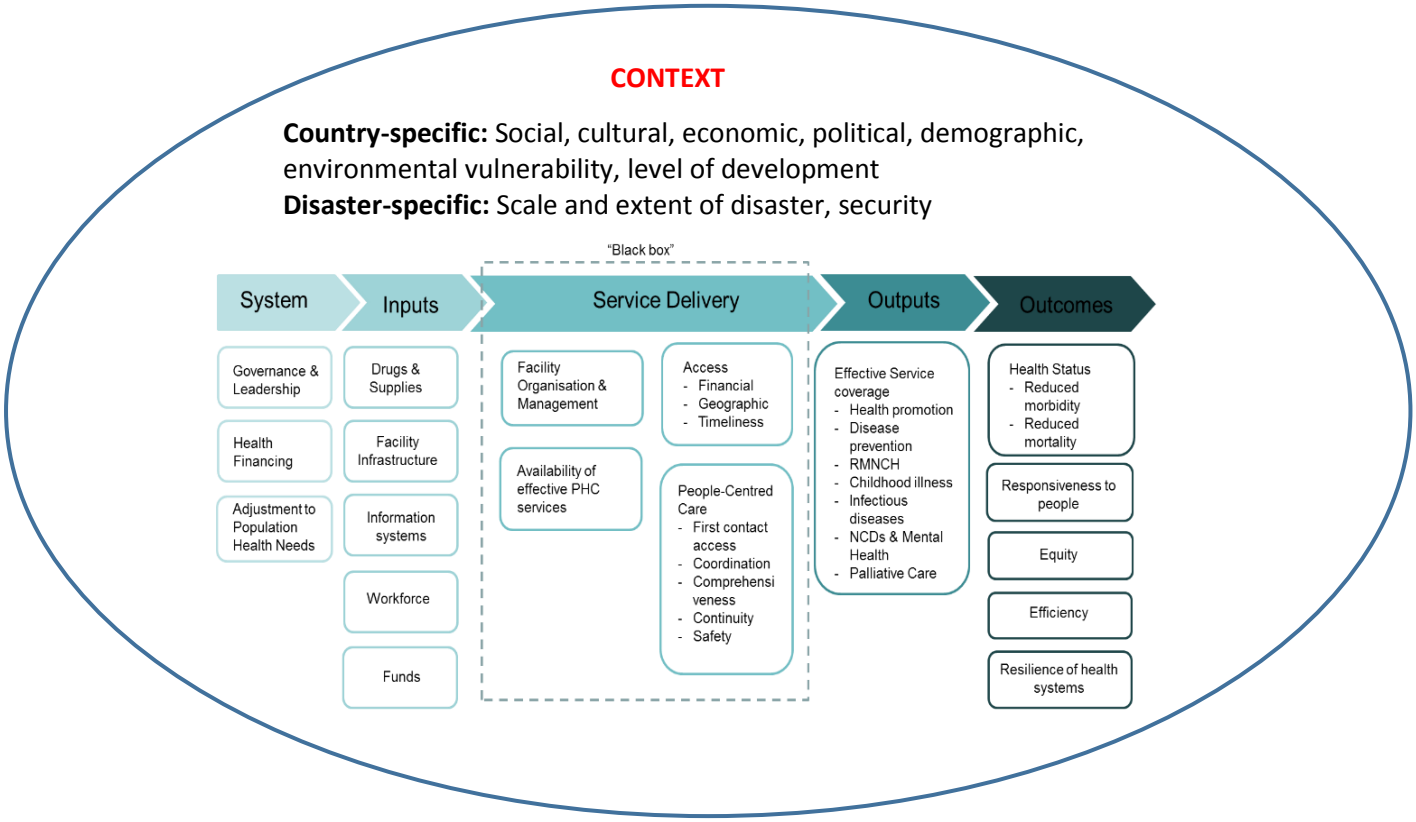


Figure adapted from Primary Health Care Performance Initiative Methodology Note, available from: https://improvingphc.org/sites/default/files/PHCPI%20Methodology%20Note_0

Context

The literature review and case study on northern Nigeria highlighted that understanding the context within which a humanitarian emergency occurs is crucial to designing appropriate health interventions. In addition to well-understood contextual factors of a health system such as the social, cultural, economic, political and demographic factors, there are some specific feature of context in the humanitarian setting that need to be taken into account. From a broad perspective, they include the level of environmental vulnerability of the country and the level of socioeconomic development. There are also disaster-specific factors such as the scale and extent of the disaster as well as the security context affecting the system. Depending on the emergency and the intended intervention, different aspects of context will feature over others and impact on the response by international actors. For example, the intervention strategies that international humanitarian actors will employ in highly insecure contexts, such as in an active conflict zone or in rebel-held groups, will be different to that in low security contexts. It is important to recognise which aspects of context are likely to impact on the intervention to understand where it may have greatest benefit to the population or where it may fail. As Pawson explains, complex interventions which act on complex social systems are very dependent on context and implementation (337). The beginning of the conceptual framework is illustrated in Figure 8.4, which shows that the health system lies within the greater context of the country and of the contextual factors specific to the humanitarian emergency.

Figure 8.4: Initial conceptual framework of a primary health care system in a humanitarian emergency highlighting context



The sub-systems in the humanitarian health system

During a humanitarian emergency and response, the humanitarian health system will consist of numerous sub-systems. These sub-systems are composed mainly of the multitude of diverse actors responding to a humanitarian emergency, as previously explained. Invariably, a crucial actor in the humanitarian response will be the national health system of the affected country. The national health system has the governance mandate to provide first-response and is often charged with coordinating the health response during a humanitarian emergency. It is necessary to appreciate however, that there are circumstances where the national government does not control the whole country – for example, in countries like Syria, Yemen and South Sudan, and/or the national health system may have low national coverage. The health service provider in these situations may be other national agencies, local non-government agencies or even political or armed groups.

Depending on the capacity of the national health system to respond to the emergency, in most humanitarian emergencies will be international actors supporting the affected country. It therefore becomes necessary for the national health system to work collaboratively with the multiple

international actors that may become involved in the response. In countries with weak existing health systems, international actors become a significant part of the health system. The multitude of international actors, including UN agencies, international NGOs, private medical groups, military groups, church groups and others, can be thought to form the 'temporary health system' – a sub-system of its own. This sub-system works to fill in a gap in the national health system of a crisis-affected country and temporarily provide health care to affected populations.

Most importantly, the biggest but arguably the most overlooked actors in the health system are the people and communities themselves, who are affected by the disaster. The heart of primary health care is people and communities, and this should not be different in a humanitarian emergency setting. The literature review identified that the concept of person-centredness in primary health care service delivery during a humanitarian emergency is largely forgotten. The person rooted within their family and community structures form the third major sub-system. This person-centred approach, enforced in the WHO framework on integrated person-centred health services, means that individuals and communities are integrated into the design of PHC programs along the continuum of a disaster response.

Figure 8.5 builds on Figure 8.4 to show the sub-systems formed by the key actors of the primary health care system in a humanitarian emergency – that is, the national health system or other national agencies, the 'temporary health system' formed by numerous international health actors and by people, families and communities receiving health care. Each circle represents a sub-system within the greater system. The national PHC system can be considered as a sub-system within the larger health system that is formed during a humanitarian emergency. The individuals, families and communities affected by a disaster form another important sub-system, and can play an important role in PHC planning and decision-making if they are included as partners in the process. The numerous international actors that intervene in an emergency can be thought of as the 'temporary' health system that is formed during an emergency. This is a sub-system of its own. The numerous actors are placed in one circle to simplify this diagram. The more complex version of this diagram would be that of Figure 8.6, where the numerous intervening international health actors, create sub-systems of their own. One can imagine that there would be many other intersecting sectors, such as Shelter, Water & Sanitation, Nutrition and others relevant to the delivery of quality PHC that could be included in this diagram and are a part of this complex system.

Key components of the sub-systems

It is important to recognise that each of the sub-systems of the national and temporary health systems will contain its own system elements, thus displaying self-organisation. For example, the

national primary health system will have its own 'System-level' factors such as mechanisms for governance and leadership, methods of health financing, principles for adjustment to population health and priority-setting. The national health system will also have its own Inputs, such as health facilities, workforce, drugs and supplies and information systems. However, the temporary PHC system formed by the numerous service providers will also have their own 'System' and 'Input' components.

Figure 8.5: Conceptual framework showing the sub-systems formed by the main actors of the health system – the national health system, the 'temporary health system' and people/communities

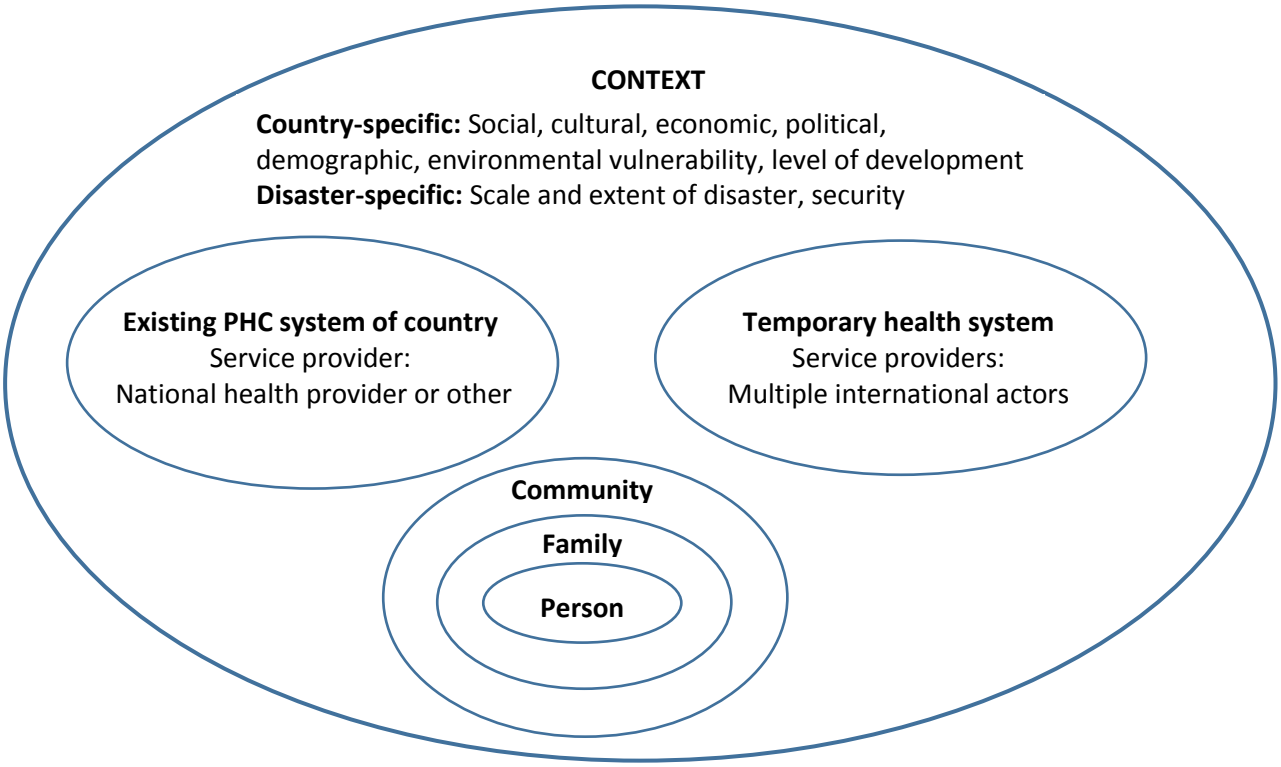
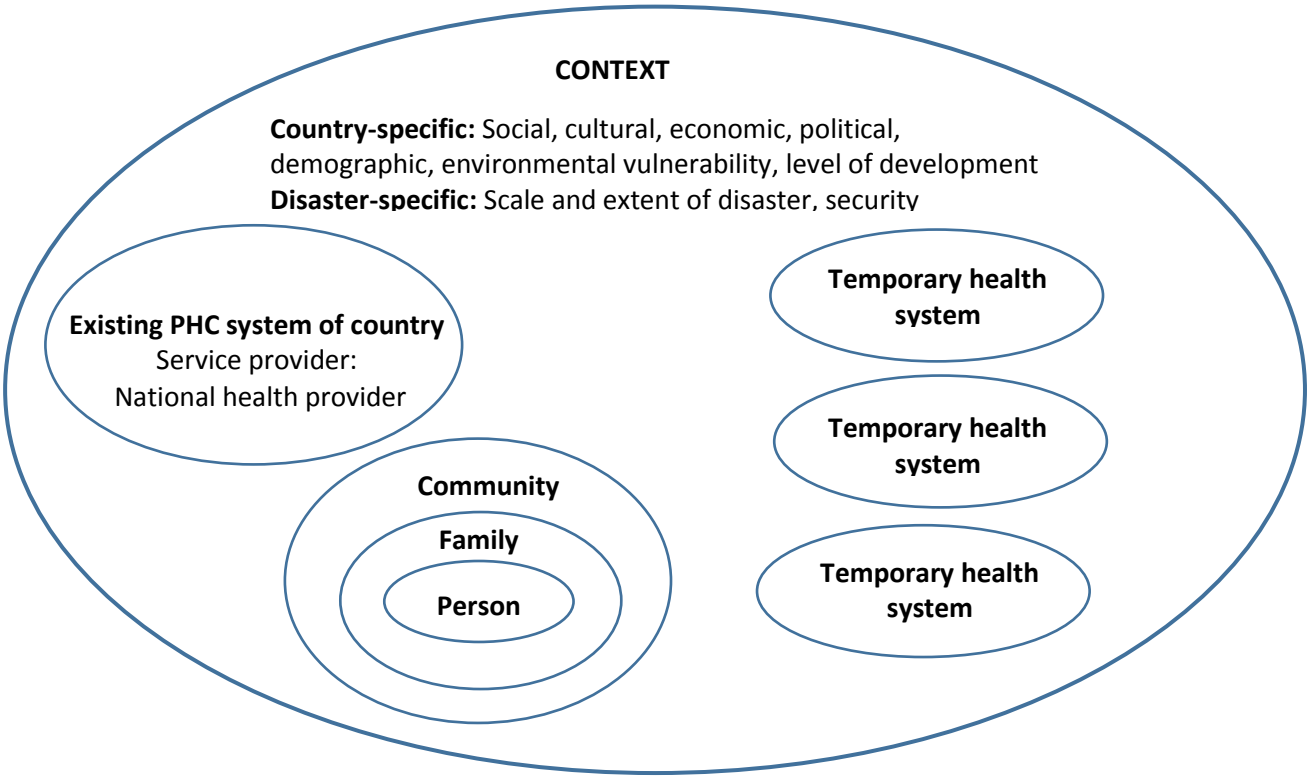


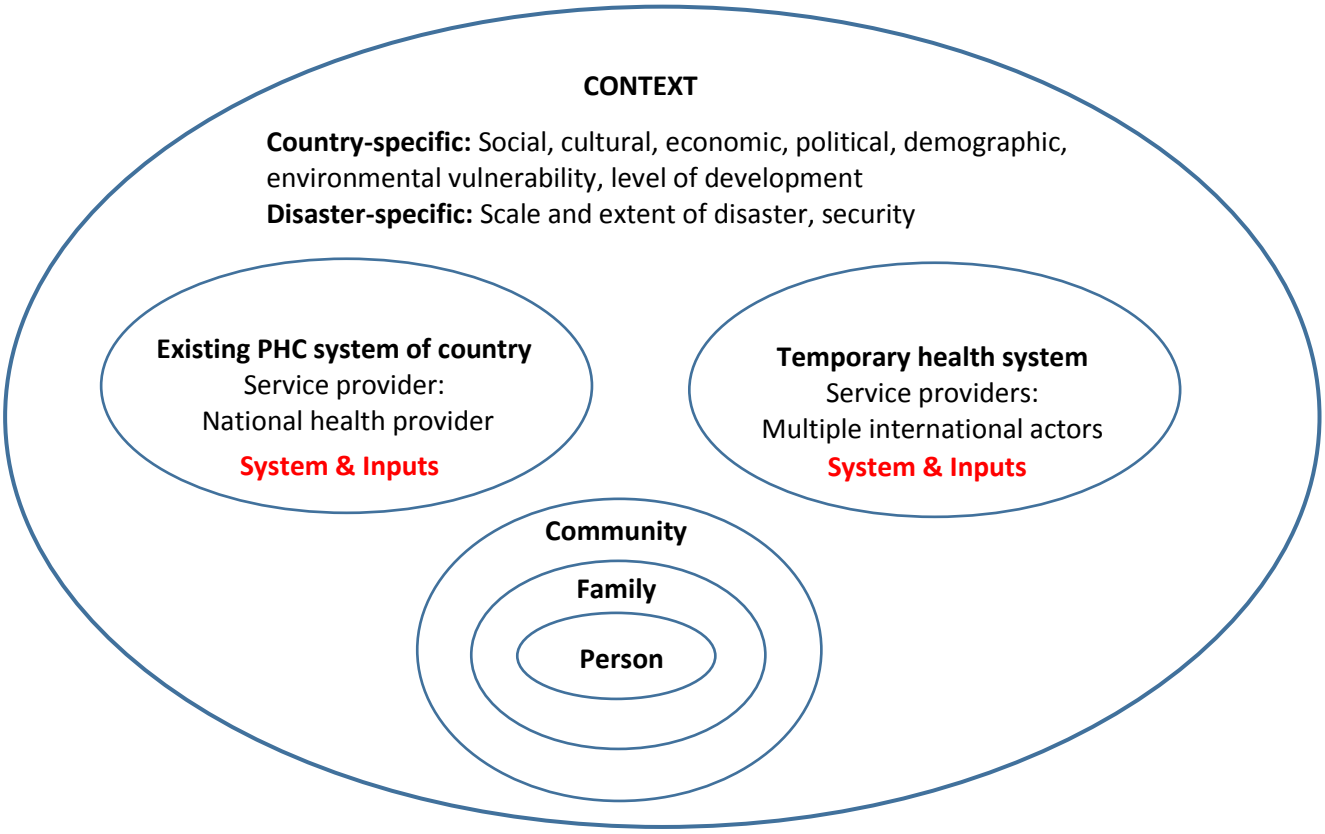
Figure 8.6: Conceptual framework showing the sub-systems formed by the main actors of the health system – the national health system, the numerous international actors forming the 'temporary health system' and people/communities



Each international health actor will have their own governance and policy-setting mechanisms, mechanisms for health financing and setting priorities. International actors will also have their own 'Inputs'. They may develop facility infrastructure, have their own drugs and supplies, information systems and workforce.

The scoping review identified that the national health system during a humanitarian emergency will have varying elements of its 'System' and 'Inputs' exist within the system domains. The interaction between the national and international health system will be to complement the national health system to provide health service coverage. Figure 8.7 builds on Figure 8.5 to show that the national and temporary health system have their own system factors and inputs within their sub-systems contributing to the overall system.

Figure 8.7: Conceptual framework showing the 'System' and 'Inputs' of the national and temporary health sub-systems



Interconnections of the system

Meadows states that the "behaviour of a system cannot be known just by knowing the elements of which the system is made" (317). Much like knowing the different organs in the human body than about how they interact with each other, it is easier to learn about a system's elements than about its interconnections. Many interconnections are flows of information: signals that go to decision points or action points within a system (317). They may exhibit adaptive, dynamic, goal-seeking, self-preserving and sometimes evolutionary behaviour (317).

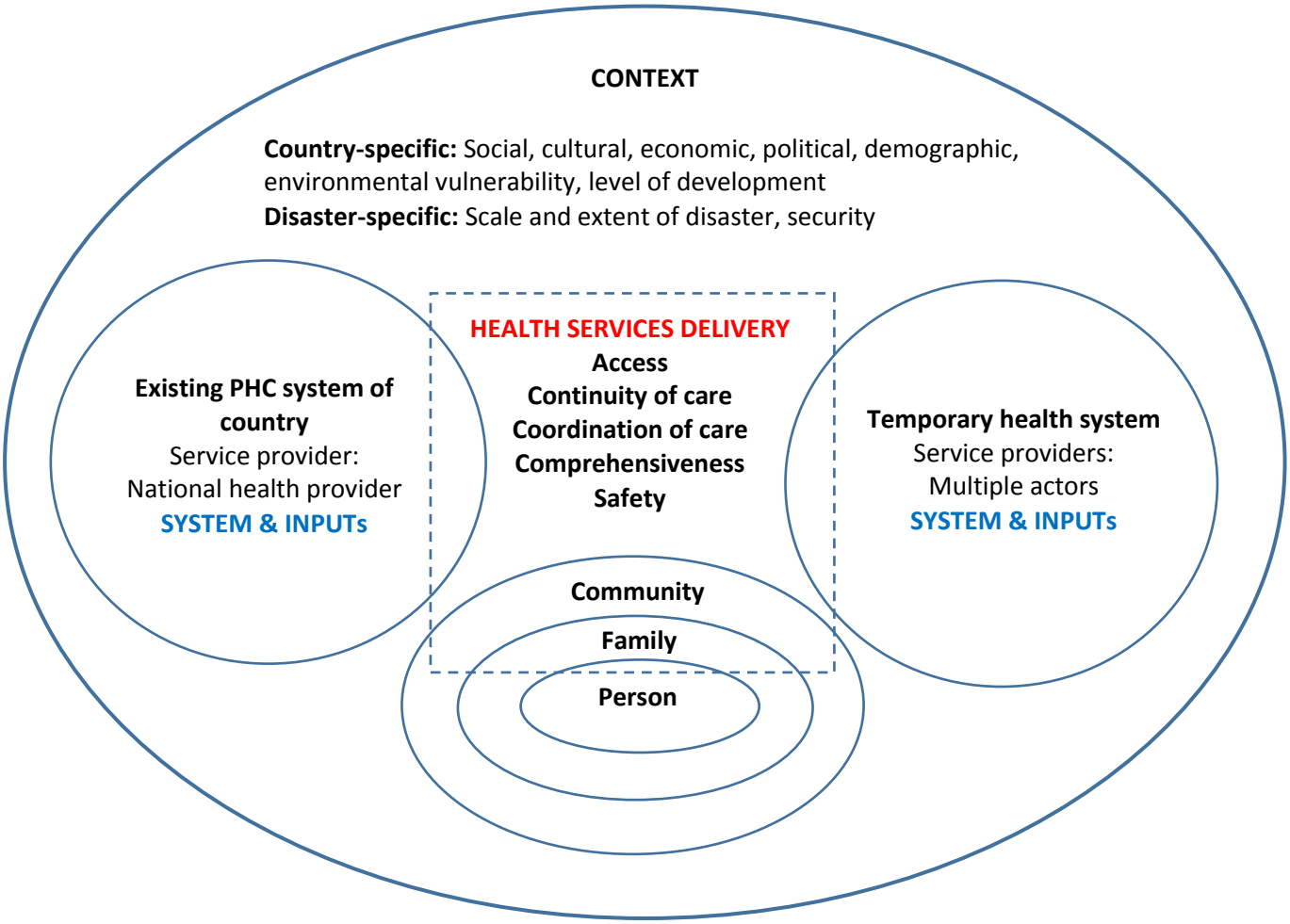
During a humanitarian emergency, the purpose and the structural elements of the system may remain the same, albeit varied to different extents; what is guaranteed is to be different in every emergency, are the *inter-connections* between elements of the system. This is particularly true with respect to health service delivery.

While the inter-connections can only be observed and cannot be pre-determined, I argue that the inter-connections of the PHC system in a humanitarian emergency are geared towards achieving the key principles of primary health care service delivery. As described by Starfield, these are well-accepted to be first-contact accessibility, continuity, comprehensiveness and coordinated care (92). The PHCPI group has identified the additional element of safety or quality of care as an important principle of PHC service delivery (71). The interconnections and processes that may result between agents and elements of the system will be to enable these key principles of PHC to be achieved.

Figure 8.8 shows that the three sub-systems of the national health system, the temporary international health system and the sub-system of the affected population are linked in their common interest to deliver primary health care services that are accessible, coordinated, continuous, comprehensive and safe health services.

The PHCPI framework presents a linear system of elements using the commonly used input-process-output-outcome logic model, indicating logical, linear relationships between constructs. The service delivery domain was presented as a black box. However, if we acknowledge that the primary health care system in a humanitarian system is a complex adaptive system, then this linear model does not apply. Whatever existing health system was in place prior to the humanitarian emergency, it has been disrupted by the event. The conceptual framework in Figure 8.8 shows that the new system in place is complex, dynamic and interactive. This system needs to constantly adapt and change to its changing environment.

Figure 8.8: Conceptual framework showing the interconnections between the sub-systems centred on the key principles of primary health care service delivery

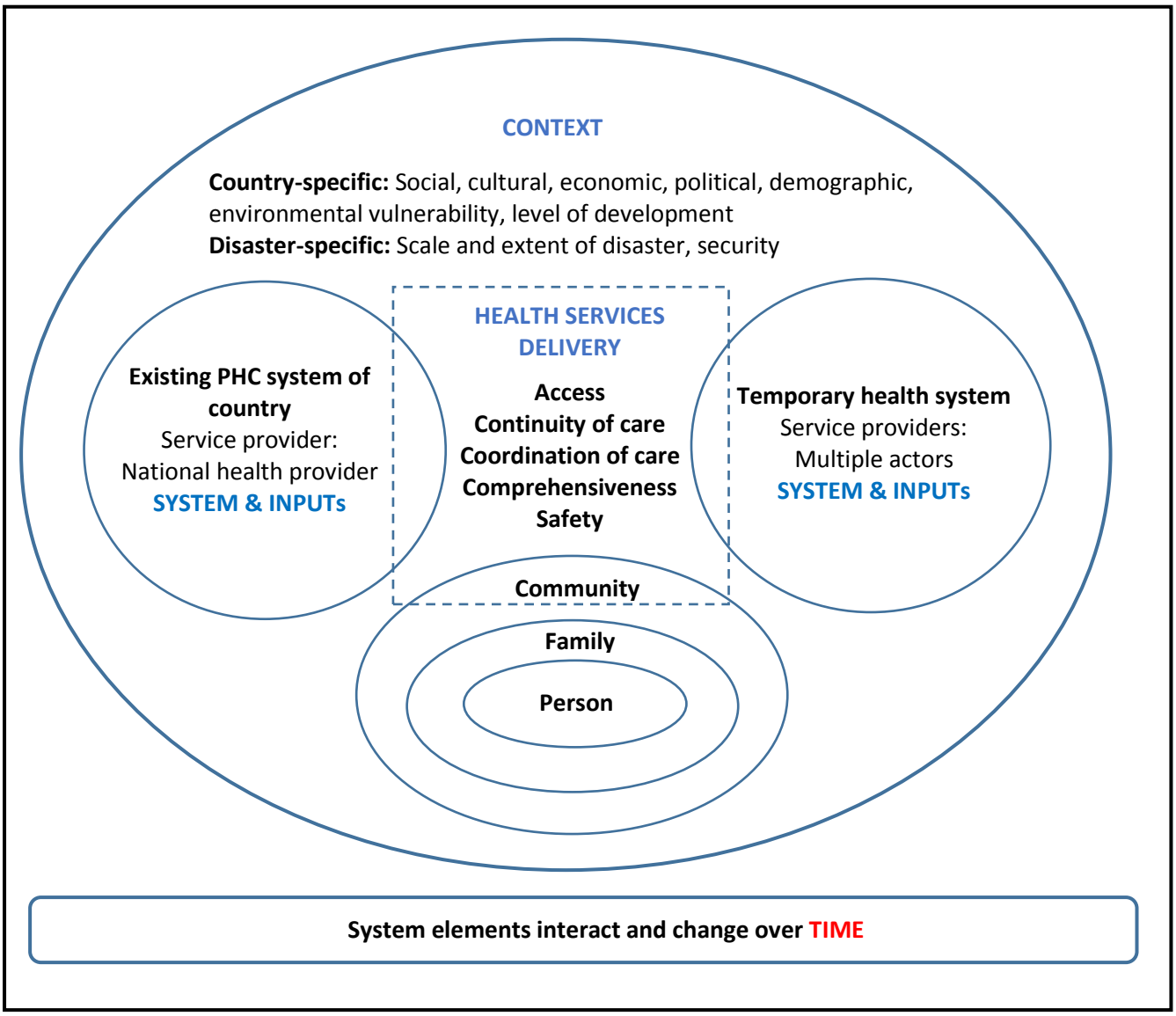


The element of time

The literature review identified that in any given humanitarian emergency, the state of the emergency is constantly evolving. As the humanitarian situation evolves, the response also needs to change to meet the new requirements. There is an element of time that is important in the approach to primary health care service delivery. The response that is needed 2 days after a disaster may not be what is required 2 weeks, 2 months or even 2 years after the event. As time post-disaster changes, the level of involvement by each sub-system may also change. For example, in the acute phase of a humanitarian emergency, the temporary sub-system, with its System and Input elements, may have a bigger role to play. However, in the longer-term, or in the recovery phase, the national health system may step in again and take on the main role of health service provision. The input from each sub-system may vary depending on the phase of the disaster.

Due to this constantly changing environment and external influences, and the requirement for the system to adapt to this, international actors cannot have a one-size-fits-all approach. The approach to service delivery must adapt over time, continuously evolving itself to match the requirements of the external environment. This final element of time is shown in Figure 8.9.

Figure 8.9: Final conceptual framework showing that the primary health care system in a humanitarian emergency changes over time



8.4 Utility of the conceptual framework

In thinking about the health response to a humanitarian emergency, it may not be immediately obvious that a health system is being formed. However, in considering the numerous national and international health actors, the resources and 'Inputs' that these actors bring, their ways of working,

and the length of time spent by these actors in increasingly protracted crises, it becomes apparent that they are a part of the health system of a disaster-affected country. Therefore, it is imperative that international health actors understand the system within which they are working, if they are to deliver health services that are effective and relevant to the populations receiving them.

The conceptual framework shows that PHC health service delivery will be influenced by a number of interacting variables represented within the sub-systems of the national PHC system, the temporary PHC system and the communities affected by the disaster. Therefore the ensuing approaches to PHC service delivery which will inform models of care, intervention strategies and policy options must take into account national health system factors, capabilities of the international agencies and the local population in developing an approach to health service delivery that is able to achieve the health outcomes in the most appropriate and targeted way.

From the findings of the literature review, it was unclear the extent to which service delivery and models of care changed in the varying disaster settings and countries in which international actors intervened. International actors provided services at fixed health posts or via mobile clinics. However, one can imagine that the health system and input of one country will not be the same as the system and inputs of another; neither will the scale and extent of the damage caused by a natural disaster, nor the scale and extent of a conflict. Similarly, the characteristics of a population will not be the same in any given community, village, city or country. Invariably, the components of the national health system, the temporary health system made of numerous intervening actors and the characteristics of the population will change in every humanitarian emergency. Therefore international actors need to develop context-adapted approaches to PHC service delivery in every setting in which they work. Table 8.1 gives examples as to the kinds of variables that can be affected within each of the system elements described in the conceptual framework. It is necessary to understand the extent to which these variables will be affected in a given emergency situation to understand the best approach to health service delivery.

In using the conceptual framework, it is important to recognise that understanding the context in which the three sub-systems lie is perhaps more important than understanding the sub-systems themselves, or the interactions between sub-systems. The context is a part of the system, however, an appreciation of the context within which the sub-systems lie is vital to understand the approach that should be taken to service delivery. Take for example, service delivery in a high-security context (disaster-specific contextual factor), such as that in Arsal, in the Bekaa valley in Lebanon, as described in Chapter 6. Delivering PHC services in the town of Arsal was influenced by the level of security, such that the 'Inputs' of MSF were limited to available facility infrastructure, drugs and supplies and

health workforce within the town itself. The approach taken was different to that of other MSF clinics in the Bekaa valley, which were in a lower-security context, and where MSF had more flexibility in their approach. In the case study on Nigeria, I showed that it was necessary to understand the social and cultural context in which MSF was delivering services in order to have an impact on health outcomes, such as maternal and neonatal mortality.

Table 8.1: Example of variables that can affect primary health care service delivery in a humanitarian emergency, according to the major components of the conceptual framework

Contextual factors	National health care system	'Temporary' / International system	Individual, family, community actions and worldviews	Time factors
Level of education of a society	Coverage of existing health facilities	Financial resources available to agency	Familiarity with seeking care at PHC level	Urgency of the required response
Level of economic development of affected population	Availability of health workforce	Importance placed on engaging with community	Assumed importance of seeking PHC services	Phase of the disaster
Level of security of disaster	Degree of primary health care policies in place	Use of drugs and supplies that are familiar to the population	Accuracy of beliefs about health	Importance of seasonal variations
Extent of disaster	Level of funding towards PHC	Availability of drugs and supplies	Strength of cultural practices impacting on PHC utilisation	
	Quality and extent of information systems	Extent of mandate to act in a humanitarian emergency		

Another example of the application of the framework to Nigeria can be seen when considering the way in which MSF tried to 'fix' the problem of an overcrowded hospital. The solution to this problem was to increase the number of hospital beds – a linear solution to a complex problem. However, increasing the number of hospital beds, resulted in even more women coming for care, an example of a reinforcing feedback loop. An alternative 'systems' solution, might have been to analyse the factors that were contributing to this overcrowding by considering the context in which overcrowding occurred, the contribution and influence of the national health system and the

attributes of individuals themselves. The potential solution may arise from greater consideration of all these variables.

It is not enough to think of the system in building blocks, as health systems have been traditionally conceptualised. It is necessary to understand the interaction between the elements or building blocks of the system, in order to understand how the system can best achieve its purpose. For example, in the case study in Lebanon, providing continuity of care for patients with NCDs required an understanding of the interaction between local security conditions, the availability of facilities, geographic accessibility to clinics and the individual characteristics of patients seeking care. In Chapter 7, I showed that patients attending MSF clinics in Baalbeck and Majdal Anjar had lower odds of being followed up in care past six months, compared to those seen in Arsal. Factors influencing this outcome, among others, were likely to be local security conditions, the availability of facilities, geographic accessibility to clinics and the individual characteristics of patients.

The nature of primary health care service delivery in a humanitarian emergency is complex. The conceptual framework presented here may help health service providers navigate this complexity by providing a framework to analyse the important, interacting factors at play within the system in which they are operating. If we can understand the dynamic processes of the system elements and their interactions, and how this changes over time, we might be able to understand the behaviour of this complex system. Ultimately, it will allow practitioners to think and act differently in their approach to PHC service delivery in humanitarian emergencies.

8.5 Strengths & limitations of conceptual framework

The major strength of this framework are its conceptualisation of the humanitarian system through a systems lens and its consideration of the contributions from the key actors involved in providing and receiving PHC services during a humanitarian emergency. It provides a practical visualisation of the relationships between the sub-systems geared towards achieving the key principles of PHC service delivery. It shows that the system is dynamic and inter-connected and varies by context and over time. It considers the micro- and macro-level dimensions of the system, by considering the individual, family and communities as well as the wider system-level factors impacting on service delivery. This framework provides an important tool to potentially support policy development and the implementation of PHC programs in humanitarian emergencies.

However, this is not a perfect model or all-inclusive of the complexity of the system. The limitations of this conceptual framework are that it is a theoretical picture of the PHC system based on my own

observations, analysis and conceptualisation. I have not analysed in great detail the specific elements of the humanitarian health system; therefore, there may be elements or key interactions missing from this framework. The framework also does not show the other sectors that are important in PHC service delivery. This conceptual framework requires expert assessment of its validity and feasibility and its applicability to actual planning and practice.

8.6 Summary

In this chapter, I synthesise the findings of my research from the previous chapters and propose a conceptual framework which may be used by international actors when designing approaches to primary health care service delivery in humanitarian emergencies. Using the principles of complex adaptive systems, I showed how the health system in a humanitarian emergency is complex, inter-connected and dynamic. The conceptual framework provides a mechanism for international actors to understand the system in which they are operating. I argue that it is necessary for international actors to develop context-adapted approaches to PHC service delivery, taking into account the capacity of the existing national health system and the perspectives of people and communities affected by disaster.

There is not guaranteed to be one PHC model or approach that will work in a given humanitarian emergency. The needs of a humanitarian emergency changes constantly, as does the capacity of the national health system to respond, and the health needs of the affected population. Therefore, it becomes necessary for health service providers to conduct regular analyses of the context and sub-systems, as the emergency evolves over time. International actors need to understand the dynamic behaviour of the system in which they are working and adapt their strategies and approaches accordingly. As Pawson describes, a focus on "system-wide approaches helps with understanding the broader policy environment and context in which particular initiatives are implemented, what the specific initiatives are trying to achieve, their history and evolution, as well as the linkages and interactions between them and other elements that comprise the system" (337). It might not be possible to understand all the inter-connections of the system, but it is necessary to observe and understand the system, if international actors are to develop effective and relevant interventions.

Chapter 9 Discussion and conclusion

9.1 Key thesis findings

My main goal in undertaking this thesis was to better understand how primary health care services are delivered by international actors in humanitarian emergencies. In particular, I was interested in understanding how these services are delivered in different settings while working within existing health systems, and considering the key principles of PHC. In the scoping review, I found that there was no consensus on the definition of PHC between different international health actors. Different actors delivered health services according to their own capacity and mandate, and did not necessarily incorporate the perspectives of the population receiving services into service design and delivery. I also found that the context in which services were delivered greatly influenced service delivery. Some of these contextual factors are widely recognised in non-emergency settings, and include the wider social, cultural, economic (including the level of development of a country) and political factors of a health system. However, there were others such as the natural environment, the scale and extent of the disaster, as well as the security conditions in which humanitarian emergencies occurred, which are somewhat disaster-specific, and have an impact on service delivery.

In analysing the context of an MSF maternal health care project in Jahun, northern Nigeria, I found that an inadequate understanding the social and cultural aspects of health care provision, as well as a poor analysis of the entire health system (including at the primary health care level) led to unchanged programmatic outcomes over a nine-year period. The project's major focus for several years had exclusively been on hospital level care to address maternal and neonatal morbidity and mortality. However, improvements in maternal and neonatal morbidity and mortality requires action at all levels of the health system – in the community with health education and health promotion, at the PHC level with the provision of quality antenatal care services, identification of emergency cases and referral to secondary care, and finally, at secondary healthcare facilities with the provision of life-saving obstetric care.

In Lebanon, through geospatial analysis and epidemiological techniques, I found that the availability of PHC clinics was not related to the distribution of Syrian refugees in the Bekaa valley, and that geographic access to clinics was affected by local security conditions. Distance to MSF clinics also affected the utilisation of services by NCD patients seeking care. At these MSF clinics in the Bekaa valley, I found that individual characteristics of patients affected retention-in-care past six months. Males had greater odds, and those aged over 60 years had lower odds, of being in care past six months, compared to females and those less than 17 years of age.

Finally, the conceptual framework that I developed highlighted that the health system created in a humanitarian emergency is akin to that of a complex adaptive system, in which multiple agents interact, adapt and evolve over time to serve the purpose of that system. I argue that this system needs to consider the interactions between the national health system, the 'temporary' health system composed of the numerous intervening international health actors, and most importantly, the individuals, families and communities affected by the disaster, in order to achieve the core functions of PHC – accessible, continuous, comprehensive and coordinated care. This final chapter describes the implications of these findings for humanitarian practice and suggests directions for future research. I end the chapter with the strengths, limitations and challenges of this thesis before providing final concluding remarks.

9.2 Implications for practice

There are formidable challenges facing the international humanitarian community over the coming decades. Escalating numbers of displaced persons and forced migration, growing trends in urbanisation, climate change, increasingly protracted humanitarian crises, all within an increasingly hostile environment towards humanitarian action, describe only some of these challenges. Further, the line between humanitarian assistance and international development is becoming increasingly blurred. Greater cooperation between humanitarian actors and development actors will be needed if we are to achieve the third goal of the UN Sustainable Development Goals, to "ensure healthy lives and promote well-being for all at all ages" (338).

However, this is also a time of opportunity. The growing recognition of the need to develop "collective outcomes" including with affected communities and local actors (339), the advent of new technology, and a commitment to 'leaving no one behind', including in fragile and conflict-affected states (15), allows us to re-focus our efforts to ensure that people everywhere, whatever their circumstances, have access to health care including at the primary health care level.

In this regard, the recommendations for practice by international humanitarian health actors, stemming from this thesis, relate to:

- Developing a common understanding of primary health care, and PHC service delivery in humanitarian emergency settings
- Developing context-adapted approaches to PHC service delivery
- Designing services with the national health system and individuals, families and communities affected by the emergency

- Taking measures to understand the dynamics of the humanitarian health system to inform the development of policy

These practice-points are discussed in further detail below.

In order for humanitarian health actors to work towards the common goal of reducing excess morbidity and mortality in a population via the delivery of PHC services, they need to have a **common understanding of the components of PHC.** In the absence of guidance on the requirements of PHC during humanitarian emergencies, international health actors are at liberty to design and implement their own interventions according to their own views of PHC. These interventions may fall short of the requirements of PHC in different settings and fail to adequately cover the needs of the affected population. The Sphere guidelines need to better reflect the core components of PHC, which is the: provision of comprehensive, promotive, protective, preventive, curative, rehabilitative and palliative care services throughout the life course of individuals, the performance of public health functions, multi-sectoral action and community empowerment. This new vision for PHC services in humanitarian settings also needs to incorporate the key principles of first-contact access, comprehensiveness, continuity of care and coordination of care. While these principles may need to be adapted to humanitarian settings, efforts should be made to incorporate these principles into the design of PHC interventions. They are just as relevant during a humanitarian emergency as during any other time.

There is no 'one-size fits-all' approach to PHC service delivery in humanitarian emergencies. International humanitarian actors need to **develop contextually-adapted models of care** which can be applied to different humanitarian settings. These models of care need to consider the social, cultural, political, economic, and disaster-specific factors, unique to that context of intervention. This will be no mean feat as understanding context can be difficult. In addition, from an organisational perspective, taking a nuanced approach will be challenging. It would be much simpler to have 'cookie-cutter' models of health care that can be implemented anywhere, much like what currently occurs today with PHC service delivery. However, international health actors need to challenge this status quo and understand the unique context in which they are working, to deliver services that are relevant and applicable to each population group they encounter. This will require innovation, a desire to continuously learn about their working environments, and humility to accept local ways of working. Primary health care is an approach and not an end product – learning and adaptation is a necessary part of the implementation process.

In order to integrate services with the existing health system of the affected country and avoid creating a parallel health system, international actors need to take measures to **understand the national health system in which the emergency occurs**. During a humanitarian intervention,

international actors enter the health system of a disaster-affected country – however broken and fragile that system may be. In order to design interventions that are able to complement and support the existing health system, there needs to be an assessment of the individual components of the system to identify the extent to which these are affected by the disaster. In doing so, they will be better able to identify the gaps in the system which require enhancement, and understand their own role in contributing to that system. It is likely that the entire system they enter will continuously change, therefore, this assessment needs to occur periodically. For example, assessment should occur when international actors first intervene, as part of the rapid health needs assessment and at specified points throughout the project cycle. A failure to work collaboratively with the existing health system increases the risk that the health system will become increasingly fragmented, inefficient and unsustainable.

Along with the national health system, international actors need to take steps to **include the perspectives of people affected** by humanitarian emergencies. Communities affected by the disaster will have their own values, beliefs and attitudes to health and health service provision. The person rooted within their family and community structures needs to be integrated into the design of PHC programs, along the continuum of the emergency. The notion that individuals and disaster-affected communities may have some say in the way they receive and participate in health care, is not one that is widely practiced. However, this aspect of service delivery is one which the international humanitarian community can no longer ignore. Increased self-interest in people's own health, an awareness of self-determination, higher levels of education and employment, and access to technology mean that people affected by disasters will expect more of service providers. The WHO report that health systems oriented around the needs of people and communities are more effective, cost less, improve health literacy and engage patients, and are better prepared to respond to health crises (336). As crises become increasingly protracted, there is a rising need to truly incorporate the community voice and co-design services with them, to ensure that people and communities are at the centre of service delivery.

In working with the national health system and disaster-affected communities to design PHC interventions, international actors work within a complex adaptive system. Any action taken by an actor within this system will have consequences on other parts of the system. Therefore, international health actors need to attempt to **understand the dynamics of the system** they are working in, to identify the correct leverage points in the system and act accordingly. Actors within this complex system need to learn about the system's inter-connections and causal links between key variables, the dynamics of the inter-connections and how these change over time. This will force

a shift in thinking from causal chains to causal loops. International humanitarian actors might be able to think in silos, but they cannot act in silos.

9.3 Implications for research

Based on activity, much of the health response that is conducted in humanitarian emergencies is at the primary health care level. Yet, little is published on this topic, at least in the peer-reviewed literature. This is not surprising; there have been numerous calls by many to strengthen the evidence base on effective humanitarian health interventions over the last two decades. (147, 340, 341). However, as the aphorism goes, "Absence of evidence is not evidence of absence". While the 'evidence' might not be published, there is undoubtedly much experience and knowledge within the international humanitarian community on primary health care service delivery that should be capitalised on. There is a need to put down on paper what is done in practice.

Some pertinent areas for further research on primary health care service delivery in humanitarian emergencies are:

- To identify factors which positively or negatively affect the implementation of effective primary health care in humanitarian emergencies.
- To identify effective PHC models of care which can be adapted to different contexts and applied in varied emergency settings
- To develop methods that can be used by humanitarian health actors to rapidly assess the needs of the PHC system during a humanitarian emergency
- To ascertain how international agencies can better engage disaster-affected communities to co-design health services throughout the phases of a humanitarian emergency
- To understand how the health sector can better work with other sectors relevant to PHC such as water and sanitation, food, nutrition and others to develop a multi-sectoral approach
- To understand how PHC services can be best delivered during the acute emergency phase of a disaster to positively impact the PHC system post-emergency and in the recovery phases

These research topics may be considered by humanitarian organisations and funding bodies such as the charitable group, Elrha which conducts 'Research for Health in Humanitarian Crises' (342).

Not all kinds of research are appropriate in humanitarian settings. Certainly, high-quality randomised controlled trials are not necessarily the desired approach to answering questions on complex social

interventions in humanitarian settings. To address the above research areas, there is a need to think differently, collaboratively and consider non-traditional research approaches. These include:

1. Developing communities of practice

The concept of communities of practice (CoPs), first described by Lave and Wenger, has its roots in 'situated learning' – the idea that learning is a function of the activity, context and culture in which it occurs (343). While CoPs have reportedly been more widely recognised and used in the business sector, it is not considered a new concept in health care (344). Acknowledging that health care delivery remains a practice based on relationships, interaction and in the "improvisation inherent in situated intelligence", CoPs have been used as a means to enhance knowledge, improve practice and encourage innovation in the health care sector (344, 345). This underlying premise can be applied to the delivery of health care services in humanitarian settings. Taking a CoPs approach can highlight the possibility of finding 'learning partners', with the focus being on learning what is necessary for the benefit of patients. Communities of practice can be developed to build on existing knowledge within the humanitarian community to share lessons learnt, develop best-practice guidelines and models of intervention, and co-create innovative approaches to service delivery. In this setting, CoPs could exist between different international humanitarian actors, between sectors involved in primary health care at the country-level and with health service providers and the community. Communities of practice can challenge traditionally held views that see patients as merely recipients of health services to one in which patients are active participants and/or instigators of CoPs. This will require a willingness to challenge the status quo and cross boundaries to achieve what is best for the patient.

2. Community-based participatory research

Community-based participatory research (CBPR) has received growing attention as a collaborative approach to research that allows the study of intractable health and social problems (346). This term encompasses a wide variety of approaches such as action research, participatory action research, mutual inquiry and feminist participatory research (346). As opposed to investigator-driven research, CBPR involves community members and other stakeholders throughout the research process in the conception, design and implementation of research studies (346). This approach emphasises mutual respect and co-learning between partners, individual and community capacity building, systems change and balancing research and action. Multiple research types, study designs and methods are applicable. It is conceivable that there will be challenges in using this methodology in humanitarian settings, particularly with respect to potential power imbalances in the research group, obtaining representativeness of the community voice and in shared decision-making, among

other potential challenges. Nevertheless, if it can be done well, it would provide important insights and perspectives into service delivery from a wide range of stakeholders.

3. Realist inquiry and realist evaluations

Traditional research on health services has been dictated by a positivist framework, which assumes that there is a single solution towards which research will inevitably converge (319). Generalisability of results conducted within a positivist framework supposes that we can apply findings to a population different to that of the study population, and achieve the same outcomes. However, health interventions occur within complex social environments, each with their unique set of circumstances. Therefore, more recently, health systems researchers have turned towards theory-driven inquiry approaches to address this complexity (347). One of these approaches is realist evaluation, based on scientific realism. Ontologically, realism falls between positivism and constructivism, taking the stance that there is a continual interaction with reality (348). Realist evaluations focus on building, testing and refining 'middle-range' theories on complex causal mechanisms, and identifying how these interact with individuals' agency and social context to produce outcomes (208). The complete question asked in a realist evaluation is: "What works for whom in which circumstances, to what extent, at what cost, borne by whom?" (208, 348). In applying this question to humanitarian health interventions, we might be better able to identify whether a particular interventions works (or not) in a particular context. Applying a realist approach to different contexts in which PHC services are delivered, we will be able to test program theories and discern which set of mechanisms fire in these contexts to produce a particular set of outcomes.

4. Mixed methods research

Another way to address complexity in health services research is to take a mixed methods approach. As Creswell describes, mixed methods provides a mechanism to answer research questions that call for real-life contextual understanding, multi-level perspectives, and cultural influences (349). It also allows for multiple methods to be used within a single study. Typically, these include quantitative methods to assess the magnitude and frequency of constructs and qualitative research methods to explore the meaning and understanding of constructs (152, 349). This approach can be especially powerful when addressing complex, multifaceted issues such as health services interventions (152).

5. Interdisciplinary research

Primary health care cannot be considered in isolation. The requirement for multisectoral action in PHC necessitates collaborative and interdisciplinary research, where new types of partnerships, skills and expertise are utilised to develop knowledge. Interdisciplinary research is based on "integrating

theoretical frameworks from two or more distinct scientific disciplines, with the use of perspectives and skills of the involved disciplines throughout multiples phases of the research process" (350). The humanitarian community may be able to benefit from the strengths of disciplines such as ecology, environment, sociology, economy and others to address long-term, systemic challenges.

9.4 Strengths and limitations

The strengths and limitations of the individual research studies have been discussed in their respective chapters. This section provides a brief overview of the strengths and limitations of the thesis.

A key strength of this thesis was the consideration of the primary health care system in a humanitarian emergency in its entirety. This is a topic for which there is very little existing evidence, as apparent from the results of the literature review. The literature review I conducted spanned 38 years of published, peer-reviewed literature, while including more recent evidence from the grey literature. I was able to describe interventions from numerous international health actors – from foreign medical teams, to the military and large iNGOs. The review also allowed me to investigate major components of the PHC system and explore key principles of PHC delivery, such as first-contact access, comprehensiveness, coordination and continuity of care, as they applied to humanitarian settings.

Then, in the case studies on Nigeria and Lebanon, I was able to focus on several key concepts relevant to the PHC system, including the context in which services were delivered, geographic accessibility and availability of facility infrastructure and the concept of continuity of care. Finally, delving into systems thinking, I was able to consider the kind of health 'system' that is formed during a humanitarian emergency. I applied the principles of complex adaptive systems to the humanitarian health system to develop a conceptual framework which accounted for its complexity, while including the major sub-systems and incorporating the key principles of PHC. To my knowledge, this is a new and unique way of conceptualising the humanitarian health system.

The methodological approach that I used to investigate the various system components in the case studies, was that of multimethods research. This approach was particularly useful for this thesis which researched complex, multifaceted, social interventions. It allowed me to use empirical data and apply different research paradigms to gain varied insights and perspectives of my research topic.

Another key strength was that I was able to conduct research on current operational projects in humanitarian settings with one of the largest providers of medical care in these settings. This

included visits to the field, participating in project activities, including acting in an operation role in Lebanon, interacting with patients, the community, MSF staff, national health counterparts and wider members of the humanitarian community. Importantly, this level of direct interaction with field projects allowed me to gain a deeper understanding of the context, the challenges and constraints to service delivery, as well as the nuances which are not easily gleaned without a physical presence on the field. It also meant that I was able to report on research findings directly to the field. Finally, this thesis also benefited from my prior experience as a humanitarian health physician. My experience with MSF prior to the PhD delivering PHC services in varied humanitarian settings, provided background and first-hand understanding of the nature of service delivery in these settings. It allowed for a level of insight into this topic which would otherwise not have been possible.

Some of these strengths also come with limitations. I was not able to explore all aspects of the PHC system, particularly elements such as health financing and information systems. I was also unable to explore service delivery from the perspective of users of the system – the individuals and communities receiving PHC from international actors. I explored health service delivery from the perspective of international actors, giving only a one-dimensional view of the topic. In investigating the role of international health actors, my case studies were limited to those of MSF and I was not able to visit PHC projects of other international actors. Further, the projects that have been included as case studies were those that were logistically feasible and practical to visit at the time. They were not necessarily the most ideal PHC projects to study. In analysing data from these projects, I used routinely collected programmatic data from Lebanon, and conducted retrospective analysis of data gathered in Nigeria. Each of these data collection and analysis methods have their own limitations and constraints, which have been previously discussed.

Another potential limitation was looking for evidence in traditional academic sources – such as electronic databases and peer-reviewed literature. Much of the evidence and knowledge on this topic is likely to be in grey literature sources. More effort could have been made to explore these non-traditional sources of information. Further, I could have complemented the findings from the literature review by undertaking key informant interviews or performing a survey of different international actors to understand how PHC services are delivered within their organisation. However, time and resources did not allow this. Finally, my own experience with MSF and previous exposure to the humanitarian system may have led to a bias in the questions that were asked, the conduct of the research and conclusions reached, as all these aspects are clouded by my own attitudes, beliefs and views of the world.

9.5 Challenges

Conducting the research towards this thesis has had its share of challenges. As with any research involving fieldwork, things did not always work out according to plan. Undertaking research in humanitarian settings in particular is challenging due to the nature of the settings themselves. Political sensitivities, security conditions limiting movement, data collection and required ethical approvals describe some of these challenges. A good deal of flexibility and adaptability was required to overcome these.

Access to data was a particular challenge, both within and outside of MSF. Within MSF, data challenges were mainly based on having timely information – research is not a high priority for busy operational staff in headquarters who are also custodians of the required data. The high turnover of staff in projects and at headquarters also means that institutional knowledge is lost. Outside of MSF, I had significant difficulty in obtaining population-level data relevant for my work in Nigeria and Lebanon. For example, I was interested in calculating age- and sex- standardised rates for the Syrian refugee population in the Bekaa valley, however this information was not publically or easily available. In Nigeria, data were more readily available on urban parts of the country than rural, which was what I was interested in.

It was also a challenge to find expertise on non-traditional research methods, such as realist inquiry and approaches to systems thinking. It required connecting with academics from different disciplines (Environment & Ecology) and different universities. Finally, the lack of available evidence on this topic required a constant awareness of my own biases and pre-conceived ideas while maintaining objectivity and openness, to avoid inadvertently influencing the findings of the research.

9.6 Conclusion

As the number of people affected by humanitarian emergencies in the world today continues to escalate, it has never been more important to ensure that each has the opportunity to access essential health care. Primary health care provides an avenue for this to occur. While humanitarian emergencies disrupt the social fabric of communities, destroy health systems and leave governments financially and operationally incapacitated, international humanitarian actors can play a crucial role in re-orienting the PHC system. In order for this to occur however, there needs to be a paradigm shift in their approach to service delivery, whereby services are not simply delivered *to* people as passive recipients of aid, but one in which services are delivered *with* people and communities, as key stakeholders in their own health care. Ultimately, the success of PHC service delivery in

humanitarian emergencies will not only depend on policy statements, investment in health infrastructure and resource allocations, but also in a fundamental change in attitudes and values. It requires a commitment to include individuals and communities affected by disaster in the determination of their own health care, in the spirit of community empowerment.

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Appendix 1: Supplementary material for Chapter 6

Table 1: Table showing the number of morbidities by age group of patients presenting to MSF clinics in the Bekaa valley, 2014 - 2016

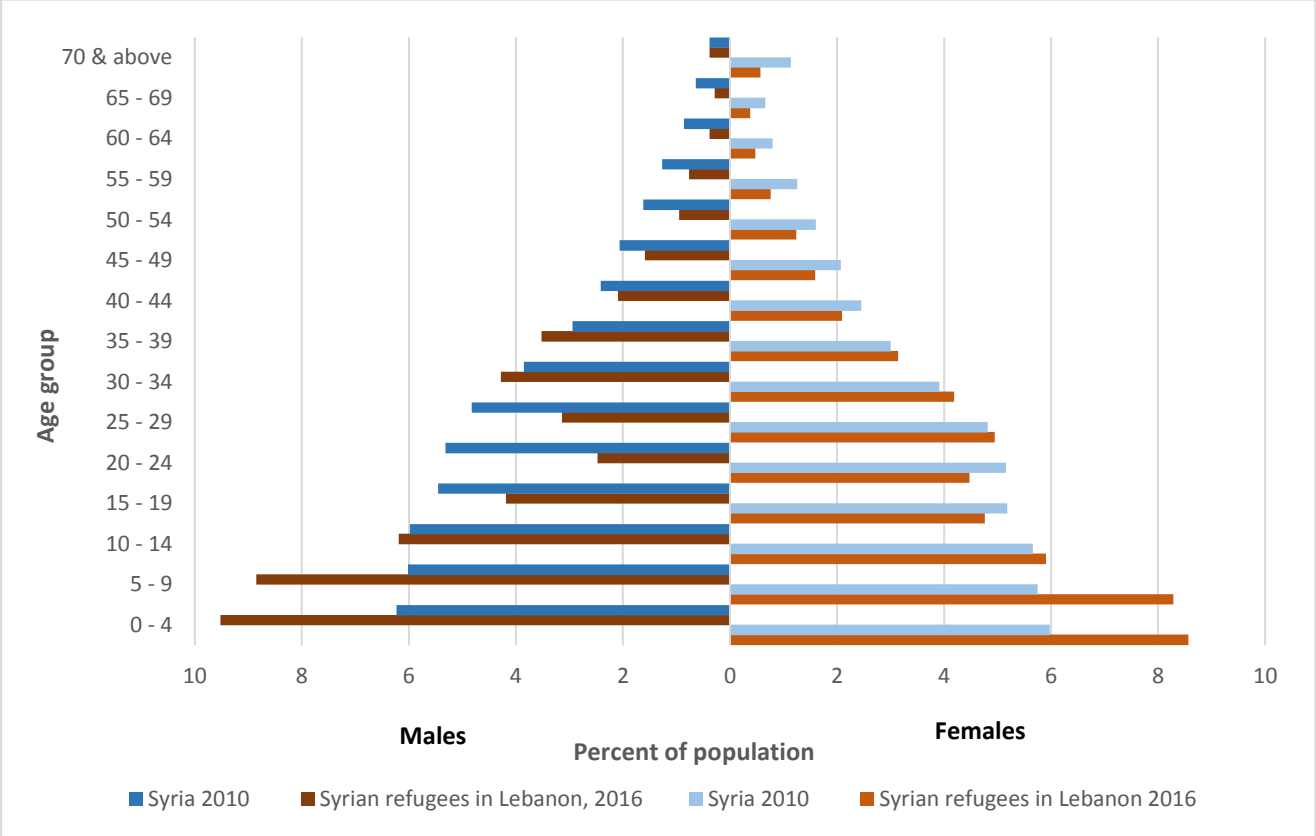
Age group	1 morbidity	2 morbidities	3 morbidities	4 or more morbidities	Total, N, 100%
0 – 17 years	15 (5.0)	286 (94.4)	2 (0.7)	0	303
18 – 39 years	41 (6.3)	572 (87.7)	39 (6.0)	0	652
40 – 59 years	81 (3.6)	1, 532 (67.8)	584 (25.8)	63 (2.8)	2, 260
60+ years	49 (3.6)	741 (54.3)	518 (37.9)	58 (4.3)	1, 366

Table 2: Table showing patients who attended MSF clinics in the Bekaa valley who lived more than five kilometres from a clinic, 2014 – 2016

Age group	Arsal N, (%)	Baalbeck N, (%)	Hermel N, (%)	Majdal Anjar N, (%)	Total, N, 100%
0 – 17 years	5 (4.7)	5 (4.7)	10 (9.4)	87 (81.3)	107
18 – 39 years	22 (12.0)	18 (9.8)	19 (10.3)	125 (67.9)	184
40 – 59 years	81 (11.3)	58 (8.1)	62 (8.7)	513 (71.9)	714
60+ years	39 (9.4)	28 (6.7)	25 (6.0)	325 (78.0)	417

Appendix 2: Supplementary material for Chapter 7

Population structure of Syria in 2010 compared with the population structure of Syrian refugees in Lebanon in 2016



Data sources:

The age/sex distribution of the Syrian population in 2010 was from the World Bank's 'DataBank' – an online analysis and visualisation tool with time series data (http://databank.worldbank.org/data/).

The age/sex distribution of the Syrian refugee population in Lebanon is extrapolated from a joint United Nations report conducted in 2016. This survey was conducted among 4, 596 Syrian refugee households composing 22, 983 individuals, stratified by district and governorate levels to ensure representation proportional to refugee population size (288).

Appendix 3: List of presentations arising from this work

The following is a list of conferences, workshops and meetings that I attended and presented, related to my PhD research during the course of my candidature, in chronological order:

- **Yapa C**, Boulle P, Glass K, Ciglenecki, Romero F, Lokuge K. Characteristics and retention-in-care of patients with non-communicable diseases in MSF clinics in Lebanon (Poster presentation). MSF Annual Scientific Days, London United Kingdom, May 2017
- **Yapa C**, Primary health care service delivery in humanitarian emergencies (Oral presentation), MSF Australia annual Open Association Meeting, Melbourne Australia, September 2018
- Attendance at the annual Humanitarian Congress – No More Excuses – Advocating for human dignity in times of crisis, Berlin, October 2018
- **Yapa C**, Housen T. Scoping review of primary health care interventions in humanitarian emergencies (Poster presentation), Fifth Global Symposium on Health Systems Research, Liverpool, October 2018
- Invitation to attend the Global Conference on Primary Health Care: from Alma-Ata towards Universal Health Coverage and the Sustainable Development Goals / Declaration of Astana, Kazakhstan, October 2018
- **Yapa C**, Transforming MSF's approach to primary health care service delivery (Oral presentation), Meeting of the MSF Medical Directors, Videoconference, January 2019
- **Yapa C**, Transforming MSF's approach to primary health care service delivery (Oral presentation), Workshop on 'Pioneering interdisciplinary health & human rights research: A workshop with Gorik Ooms', Sydney, June 2019

Appendix 4: Epilogue – Transformational PHC project with MSF

This appendix provides an indication of what I will do next with MSF, based on the findings of this PhD. Since June 2018, I have been working with MSF colleagues from across the MSF Movement on a transformational innovation project, titled "Transforming MSF's approach to primary health care service delivery". The objective is to re-design service delivery to enable context-adapted, patient-centred models of care.

The document which follows is the brief version of the concept note for this project that was presented to the MSF Medical Directors in January 2019. This project was approved for funding by MSF in September 2019.

TIC Incubator proposal: Transforming MSF's approach to primary health care delivery

Problem statement

The vast majority of care provided by MSF is outside of the hospital setting. Between eight and 11 million outpatient consultations are conducted by MSF at the primary health care (PHC) level each year compared to 250 – 400,000 consultations at the secondary care level. Despite the significance of PHC activity in humanitarian emergency settings, there are no established principles on PHC service delivery by the humanitarian community at large or MSF specifically. Typically, PHC activities are characterised by quantity of care over quality, while services may not be adapted to the local or cultural context.

The current MSF approach to PHC delivery has arguably been formulaic without taking into adequate consideration the varying needs among different communities in different contexts and countries. This raises the possibility that MSF is delivering primary health care that does not meet the needs of the users, which would seem to miss the point of good health care.

Justification for the project

At the heart of primary health care are people and communities. As humanitarian crises become more protracted, MSF will need to adapt its intervention strategies to plan for the long term. Gaining perspective from our patients and the national health system to put people and communities at the centre of MSF's interventions will be key to providing relevant, effective and contextually-adapted care.

With this proposal, we hope to address the over-arching question of: "How should MSF implement primary health care programs in the contexts that we work in?" To answer this question, we will use systems-thinking and theory-of-change methodologies to analyse our current approaches to PHC through the lens of the patient, the national health service provider (Ministry of Health or equivalent) and MSF. Using lessons learnt from this process, we aim to develop a toolkit that MSF field teams can use to implement PHC programs throughout the project cycle. By doing this, we hope to reverse the top-down implementation approach that MSF have traditionally used to deliver PHC services into something that is more patient-centred and field-oriented.

Goal and objectives

The main objective of this project is to develop an MSF toolkit for delivery of primary health care that is able to be applied across diverse contexts and ultimately leads to improved quality of services and patient-centred care. The toolkit will provide guiding principles that MSF field teams can use to design, implement, monitor and evaluate PHC activities throughout the cycle of a project and which is adapted to the local contexts that MSF works in.

Specific objectives:

- To map the systems and stakeholders that influence the delivery of primary health care in the complex environments in which MSF works
- To identify the factors which positively or negatively influence the delivery of quality primary health care
- To develop a toolkit for PHC service delivery in humanitarian contexts that is informed by patients, operational goals, field sites and national service providers

Project plan

Our proposal is in four phases as outlined in the table below.

Phase	Activity	Output	Length of time for phase	Location
Phase 1	Mapping the organisation's vision of PHC activity using a theory-of-change approach	Understanding of how PHC activities are expected to be delivered	6 months	Field and Headquarters
	Desktop systems-mapping exercise of 6 – 7 contextually varied PHC projects	Understand of PHC system in different contexts and MSF's place within it		
	Engagement with community members, MoH and MSF staff in 3 – 4 field projects	Community engagement and co-design of services		
Phase 2	In-depth analysis of 3 – 4 projects from the lenses of the patient, national health service provider and MSF.	- Identification of key themes across different field contexts - Deeper understanding of service delivery from patients and national health system perspective	12 months	Field
	Development of solutions with patients, MSF staff and MoH	Minimum viable product is a guideline for use by MSF field teams		
Phase 3	Development of toolkit by synthesising results from Phases 1 and 2	A PHC toolkit adapted for use by field teams	2 – 3 months	Headquarters

Project governance

It is anticipated that this project will be hosted by MSF Australia with the backing of one or more OCs to provide field access and partial funding.

The project team consists of experienced MSF doctors and nurses with significant field, operational and governance experience. We aim to have a member of staff from interested OCs on the project

team, if possible. We plan to collaborate with relevant inter-sectional expert platforms, working groups and support units within MSF.

In addition to the project team, we will form an Advisory Committee which will consist of members internal and external to MSF. We envision members of this committee to be subject matter experts in the field of primary health care and humanitarian service delivery who can be called on to provide expert advice and guidance on different aspects of the project.